AMERICAN VETERINARY REVIEW.

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EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, Nov. 15, 1903.

The fortieth annual meeting of the American Veterinary Medical Association was important from more than one point of view, and it is not in this chronicle that the many important parts can be brought out; yet there is one among the many which I think may escape attention, and to which I must refer, because of its connection with similar facts which have occupied the attention of veterinarians in Europe during the last few months. If one reads with care the excellent address of ex-President Stewart, he will find a most interesting part relating to veterinary education, to veterinary colleges, their curricula, their requirements, the length of their courses, etc., all of which may be resumed in a few words of criticism and warning, viz.: Our colleges are much in need of improvement, and it becomes the Association to see that those improvements exist, not only in catalogues, and announcements, but also in reality. Prof. Stewart has done well in sounding the bell of alarm. If one studies the announcements and catalogues of some of the veterinary schools of America he certainly will find that those of this year are about the same as those of previous sessions. Improvements are much in need.

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Old Europe has lately been taking measures to improve veterinary education by various ways. In Austria, where the

degree of bachelor is now required for admission, the curricula of its schools have been lengthened and increased. In Italy, bachelor degree is required for admission, five years of study before graduation can be obtained, the creation of additional chairs, opportunities to be created to allow veterinary students to follow medical studies, and *vice versa.* And even in England a special opportunity is now given for the study of tropical veterinary medicine. It seems that the first idea of this last step was suggested by Nocard in a conference that he held in Liverpool May 11, 1903, in which he pointed out the importance of the losses sustained because of the trypanosomes in India and Africa, especially by surra and nagana.

The Johnston Laboratory of the University of Liverpool has been opened, and has for its object the preparation of veterinarians as well as physicians for the special study of tropical diseases of animals. It is a post-graduate course, which certainly will do much good.

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There is also another move made in a somewhat similar line. I refer to the course of application of the school of Hanover. Carried out during the month of August, this course, where men like Dr. Dammann, Dr. Kaiser, Prof. Berg, Dr. Arnold, Dr. Malkmus, Prof. Frick and Dr. Rievel have lectured on special subjects and specialties, such as contagious diseases and their study, with practical work on their bacteriological diagnosis, meat and milk inspection, jurisprudence, etc., has met with most satisfactory and encouraging approval from every one interested, and veterinarians of all ages have matriculated for the course and become most attentive students once more.

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But from what I have said one must not accept the idea that American schools are altogether inadequate to their obligations and to the future welfare of their students. Indeed, a short time since, in looking up some veterinary educational matters, it seems to me that I read in one of them the delivery of lec-

tures on veterinary military practice. Of course, at first, it would seem that the idea is peculiar, and that, after all, whether military or private, the practice of veterinary science is always the same. Perhaps it is; and I must apply to those who have for years followed that specialty for advice; and so I address myself to my old friends Griffin, Le May and Schwarzkopf. I am quite sure they will agree with me, and will, no doubt, endorse the idea of the creation of a special chair; no, but at least the delivery of special lectures. This is suggested to me by the reading of a little work which I have just received, written as it is by a French army veterinarian, Dr. G. Joly, and is published by J. B. Baillierè et fils.

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The title of the work is "Diseases of the Trooper Horse." Dedicated to Principal Veterinarian J. Jawulet, the book treats the subject of veterinary practice strictly from the military point of view. The principal contagions, glanders and distemper, occupy the first pages, then come epizoötic lymphangitis, the typhoid affections, horse-pox, pustular dermatitis, intestinal affections, over-working, diseases of the skin, of the apparatus of locomotion (broken knees, lameness of the shoulder, of the hip, etc.), the ostitis of fatigue, the fractures, the wounds caused by harness, wounds of war (viz., by swords, by all arms, by artillery projectiles). And, after giving veterinary statistics of various armies, it is completed by colonial diseases and by those of camels.

It is an important want that this book comes to fill, and our military veterinarians will no doubt be glad to study it, even if it is in French, as the reading is easily understood, and, after all, they are all familiar with the peculiar phraseology that the subject embraces.

There are three essential points which show the usefulness of the work: (1) the specialization of the subject, imposed as it is by the peculiar conditions of life and utilization of the trooper, conditions which give to its pathology a peculiar character; (2) the manner in which the diseases have been presented,

and (3) the importance of the statistics, which demonstrate, in such powerful manner how great and valuable is the importance of the educated veterinarian in the army.

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But I see that from reading the address of the Ottawa meeting I have been brought to make remarks on veterinary education, on its improvement, and finally have filled a bibliographical notice. Let me continue and say a few words of a valuable pamphlet that Prof. Lanzillotti-Buonsanti, of Milan, has kindly sent me, "l'Esperimento della Cura dell Afta col metodo Baccelli," ("The Experiments on Treatment of Foot-and-Mouth Disease by the Method of Baccelli.") Our readers remember that several months ago I told them of this form of treatment, which at the time it was presented created such a sensation, and found among veterinarians many advocates, it is true, but perhaps a larger number of adversaries. A general experiment imposed itself, so to speak, and it is the description and conclusions of this experiment that are presented in the pamphlet I have received. Without entering into the minutia of the entire experiment, I will give you the general conclusions of the author:

"Resuming briefly, I can conclude that it being demonstrated that bovines have a perfect power to support sublimate corrosive in the therapeutical dose of 0.04 gr.–0.05 gr. per each 100 kil. of living weight, the efficacy of the treatment by the method of Baccelli is demonstrated to the point of view that intravenous injection of a solution will lower the temperature more or less, shorten the course of the disease, cure more readily the localizations, and avoid the after great losses of the animals and of their products. Therefore, the method deserves to be adopted. Applied antiseptically, it is perfectly innocuous, must be resorted to as soon as the first symptoms appear, and may have to be repeated a second and even a third time.

"When the disease is serious and on several animals, either by the great virulency of the infecting agent or special condi-

tions of the affected, and that serious lesions of the heart may occur, death early or late is unavoidable. In these cases the method of Baccelli, like other forms of treatment, is absolutely powerless to cure; . . . . but it is not justifiable to say that death is due to the injection of sublimate.

"I have said it before, and repeat it to-day, it will be only with time that the method will be appreciated to its value.

"And until an immunizing or curative serum, of easy and practical use, is found, the method of Baccelli must be the treatment of predilection, as being innocuous, when judiciously applied, and giving better results than any other treatment, and principally in the recovery of the localized lesions of aphtha."

All this is very well for foot-and-mouth disease in Italy, but I think Salmon prefers his method, and the results he can obtain with it.

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As I cannot permit my European news to be too rusty, I will, although this chronicle has been long, send our friends a few words about the last International Congress of Hygiene and Demography, which has been at Bruxelles from the 2d to the 8th of September, 1903, and to which more than 500 delegates of all nationalities were present. Among the too many questions which were discussed, one of the most important was the fifth, viz.: "*Are Human Tuberculosis and that of Domesticated Animals Due to the Same Species of Microbe, the Bacillus of Koch?*"

Thus presented, the question was difficult to answer. What was to be understood by domesticated animals? Did it mean the mammalia only, or were birds to enter also into the sphere of the discussion? For the majority, aviary tuberculosis was to be ignored, although Mr. Gratia, of Bruxelles, insisted that the bacillus of this tuberculosis was that of Koch adapted to peculiar biological conditions, which practically can be considered as of great danger to man.

As to the relations between human and bovine tuberculosis, the question has advanced but little, as no new fact has been presented.

The majority of the reporters—Gratia, de Jong, Arloing and Fibiger—fought hard for the doctrine of unicity. Prof. Kossel, of Berlin, presented *de novo* the defence of duality, and his conclusions were strongly supported by Prof. Löffler and Kirchner. It seems certain that but one conclusion is imposed, viz., that the human bacillus is less virulent for cattle than the bovine bacillus, and this conclusion is accepted by all. It is evident that there are differences to the point of view of the virulency, between the bacillus of bovines and that of man, but are those differences specific? Are they due to two distinct species of microbes, or only simply to variations of breeds, born from conditions of media and have become fixed? This is a question that by a majority of the votes one congress cannot answer, because in the scientific world, less than anywhere else, the opinion of the majority cannot be considered as being always the expression of absolute truth. It is sufficient that bovine bacillus may occasionally infect man (the most pronounced dualists admit it), and this justifies all the measures which have for effect the prevention of the use of meat or milk of tuberculous animals.

The question was thus judged, and, ignoring all doctrinal points, the congress by 25 votes against 5 declared that *human tuberculosis is principally transmitted from man to man, but in the present stage of our knowledge, Congress considers that it is proper to prescribe measures against the possibility of infection to man by animals.*

The next congress will be held in Berlin in 1907.

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I have just received a handsome view of the members and of the ladies who attended the meeting at Ottawa. It is with most gracious appreciation that I send my greetings to all, and my thanks to the good fellow who has given me this great pleasure.

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I have just received the contribution that the faculty of the New York-American Veterinary College has forwarded for the

Nocard Monument Fund, amounting to one hundred and five dollars. I have remitted the same, and am requested to address to the contributors the thanks of the Committee. I also wish to thank them personally, as this handsome response was made to my call, and shows their appreciation of one who belonged to the veterinary profession, whose work has been of such great value to it and to the world, and who will be regretted, not only by those who knew him, but among the many for whom science has no nationality. A. L.

THE ETIOLOGY OF AZOTURIA.

While the etiological factor in the induction of this common affection of horses has not yet been discovered, many have advanced theories which strongly appeal to our sense of reasoning. The most constant phenomena in its production are the short season of idleness, the unrestricted consumption of highly nitrogenous food, and the high condition of the subject, with plethora as a prominent accompaniment. Such an animal usually is attacked suddenly soon after undertaking vigorous exertion, whether in the performance of labor or at simple exercise. Upon these more or less constant conditions, theories have been evolved and promulgated by observers ever since the disease was first described, without being able in any instance to demonstrate satisfactorily the real exciting cause of the apparition of the well-known symptoms which so frequently terminate in fatality. So many exceptions, however, to this history are being recorded by various observers that we fear our theoretical notions of the pathology of azoturia will soon need revision. In the present number of the REVIEW, Dr. E. B. Ackerman, of Brooklyn, N. Y., reports two cases with systemic conditions in direct opposition to the usual history. The writer can add another fatal case occurring in an emaciated convalescent from typhoid pneumonia, the attack occurring while taking his first walk in the stable gangway, while yet receiving stimulant treatment, and even before the staggering gait had entirely disap-

peared. From these and many other reported cases of somewhat similar import, we feel that we are as far from being in possession of any real knowledge of the causes operating to produce the disease as we are from understanding its pathology and therapy.

RETROSPECTIVE.

In the forty years' existence of the American Veterinary Medical Association it has had 25 different Presidents, 15 of whom are living, and consequently 10 have passed away (Stickney, Copeman, C. M. Wood, Curtis, R. Wood, Thayer, Bryden, Huidekoper, Michener, and Clement). Of these 25 Presidents, New York and Massachusetts each contributed 8, Pennsylvania 3, Indiana 2, with one each from New Jersey, Maryland, Missouri, and the District of Columbia. There have only been 13 different Secretaries during this long period, 9 of whom yet survive, but four (Jennings, Burden, Budd aud Michener) having died. While Massachusetts furnished such a large quota of Presidents, her sons have apparently not sought the important functions of the Secretary's portfolio, as not one is accredited to her, while New York has given almost half of the entire number, there being 6 to her credit, New Jersey, Pennsylvania and Missouri have 2 each in the list, the only other State to be represented being Iowa, from which the present incumbent hailed when elected, though he has since removed to the Keystone State. New York's sons have filled the position 21 years, Missouri 8, Pennsylvania 6, New Jersey 4, Iowa 1. The longest service by one man was that of Michener, which covered the period from 1880 to 1888, Stewart being a close second with 7 years in harness, Robertson and Hoskins tying at 5 years.

ELSEWHERE in this issue will be found the report of the Committee on Animal Diseases and Animal Foods of the New Jersey Sanitary Association made by Chairman William Herbert Lowe, D. V. S., at the annual meeting of that association

held at Lakewood, N. J., Dec. 4th and 5th, 1903. Chairman Lowe's report should be read by everybody interested in modern veterinary sanitary science.

IT is announced that Dr. Frank Burr Mallory, of the Harvard Medical School, after long and exhaustive investigation, has discovered that the germ that causes scarlet fever is of animal origin, and not due to a vegetable organism, as has been held by medical men. Dr. Mallory is to present a paper to the Boston Society of Medical Sciences on this important subject.

THE Veterinary Medical Association of New Jersey was ably represented at the recent meeting of the Illinois State Veterinary Medical Association by Dr. Geo. W. Pope, Superintendent of the U. S. Animal Quarantine Station, Athenia, New Jersey. Dr. Pope is Secretary of the New Jersey Association.

PROSECUTION OF VIOLATORS OF THE VETERINARY LAW BEING PUSHED IN NEW JERSEY.—Veterinarians and others are cautioned not to attempt to practice, under any pretense whatever, in New Jersey without a license, for President William Herbert Lowe, of the State Board of Veterinary Medical Examiners, is after violators of the law. President Lowe is the author of New Jersey's new law and he is determined that it shall be enforced. "Dr." R. R. Sample, of Freehold, Monmouth County, was the first to be arrested, tried and convicted. He served some five months in the Freehold jail. "Dr." George Locke, of Flemington, Hunterdon County, has been indicted, convicted and now awaits the sentence of the court. "Dr." William E. Brock, of Rutherford, Bergen County, has been arrested for practicing veterinary medicine without a license and placed under two hundred dollars bail. Two prescriptions were found in the Bergen County pharmacy written by "Dr." Brock, which made unmistakable evidence. "Dr." C. T. Smith, while serving the Hudson Coal Company, Jersey City, Hudson County, in the capacity of veterinarian without a license, committed suicide. "Dr." Henderson, an unlicensed veterinarian, Jersey City, Hudson County, has fled from the State to avoid arrest and prosecution. The State Board is doing some detective work, and no doubt other arrests and prosecutions will follow if necessity should require.

ORIGINAL ARTICLES.

PASTEURELLOSES.

By Prof. E. Nocard, of Alfort.*

Under the name of "Pasteurelloses," Ligniéres has collected all of a group of infectious diseases included before under the appellation of "hæmorrhagic septicæmias."

We know that Hueppe while studying the bacteria of *Wildseuche* of Bollinger in 1886 was struck with the resemblance that it had with those of *Schweineseuche* of Löffler, of septicæmia of rabbits of Gaffky, and of chicken cholera of Pasteur. A comparative study of these four microbes convinced him of their identity; morphology, biological properties, pathogeneous effects on animals of experiments, all were superposable; and, again, the etiological conditions of those four affections being similar in many points, Hueppe came to the conclusion that there were in reality various forms of one and an alike infection, for which he proposed the name generally adopted of "hæmorrhagic septicæmia."

Since then the boundaries of "hæmorrhagic septicæmia" have considerably enlarged. At first, all the infections due to an *ovoid bacteria* (*cocco-bacillus*), *not colored by the method of Gram*, *cultivatable on gelatine*, *without liquefaction of the media*, were classed in it; then, the characteristic becoming little by little less precise, numerous other forms more or less close to it, which could not be placed with other groups less open, were thrown into it, and thus diseases due to bacteria colored by the Gram or liquefying gelatine were found among the others. On the other side, while a greater number of infections were thus made related to hæmorrhagic septicæmia, their pathological species were indefinitely increased; as soon as were observed the

*The last work written by the learned professor, delivered by him in a lecture at the Pasteur Institute, published in the *Revue Générale de Medécine Vétérinaire*. Translated by A. Liautard.

absence of one of the secondary characters of the microbe type or some difference in the biology or virulence of the microbe, a new disease was created.

It is in this way that the list of the septicæmias of birds has been increased by the addition of enzoötics, which it was thought proper to differentiate because of some peculiarity of the bacteria which was studied, peculiarities which most often were insignificant.

On another side, the name proposed by Hueppe was not very proper; it is by the comparative study of specific bacteria that he came to identify the diseases observed, and it is to an anatomical character, important but inconstant, that he borrows the label which he has just created.

Indeed, if the very acute forms of the diseases thus grouped are very similar and deserve well the name of hæmorrhagic septicæmia, it is not so any more for the subacute forms, or those chronic from the start, where the lesions, localized on one or another viscera, arrive after a slow evolution to caseification or sclerosis of the tissues.

And, again, the septicæmic evolution and the congestive and hæmorrhagic lesions referred to by Hueppe are observed in numerous affections, very different from each other, and that no one would think to relate to the former (anthrax, rouget, etc.).

In reality, the variability of the evolution is such for the various infections, and even for one single infection, that a criterion for the formation of groups of types or for their differentiation cannot be asked of pathological anatomy. And, again, I repeat it, the synthesis realized by Hueppe was based on the comparative study of pathogeneous bacteria, and it was to that unique point of view that one had to consider to revise usefully the existing classification. This serious work has been undertaken by Ligniéres, director of the Bacteriological Institute of Buenos Ayres; it is far from being complete, but the results reached so far have thrown a strong light on the subject and a little order in the present chaos.

After eliminating from the hæmorrhagic septicæmias diseases manifestly foreign to them, Ligniéres has created two distinct groups: the "Pasteurelloses" and the "Salmonelloses."

The former are due to microbes analagous to the bacteria of chicken cholera and classified by Trioisan in the gender *Pasteurella*. The gender *Salmonella*, recently created, has for type the bacteria of hog cholera of Salmon.

If the family of the *Salmonelloses* is scarcely outlined, and so far only includes the infection type, hog cholera or swine pest, it is not the same of the family of the *Pasteurelloses*; this one has been well studied, firmly built, and includes a great number of serious diseases, attacking all animal species.

All the affections which are thus grouped are due to bacteria which belong to the gender *Pasteurella*, and which present all of the following essential characters: *Cocco-bacilli, with colored poles and clear centre; very polymorphous: immobile; giving no spores; specially ærobic; not colored with Gram; cultivatable in meat bouillons, on gelose and gelatine; not cultivatable on natural potato with acid reaction; not liquefying gelatine; not coagulating milk; not giving indol in pancreatic bouillons; not reddening the gelose of Würtz; giving with cultures in bouillons a suigeneris odor.*

These characters are common to all the Pastuerellas and can be always verified. But the variability of each type is such that they cannot be differentiated with certainty one from the other, neither by their biological characters, nor by their pathogeneous effects upon reacting animals.

Indeed, the pathogeneous action of all the types is the same or about the same on mice, rabbits and guinea-pigs.

Inoculation under the skin of a mouse, in the muscles of a rabbit, in the peritoneum of a guinea-pig, will kill rapidly (8 to 30 hours), and the autopsy will reveal extensive lesions of hæmorrhagic septicæmia, and if the injection has been made in the peritoneum, the cavity will ordinarily contain a reddish abundant fluid, very poor in cells, very rich in microbes; at even doses, the inoculation of the peritoneal exudate seems much

more virulent than that of the richest culture in bouillon serum.

The cultivation of the blood and visceræ shows that the microbe has invaded the whole organism ; but if pure cultures are desired, the autopsy must be made immediately after death ; often, even before death, the organs are invaded by banal microbes, coming from the lungs or the intestines.

This promoting action of the pasteurellic toxines towards secondary infections is observed not only on the small animals of experiments, but it is also manifested in natural infection, and among the peculiarities of the history of the Pasteurelloses, one of the most interesting is the frequency and severity of secondary infections in all the subacute or chronic forms of the disease. Even, sometimes, the action of the Pasteurella is ephemeral and so slight that it may pass overlooked ; nevertheless, its toxines have had time to make upon the phagocytic cells such depressing effect that the organism may become the prey of the vulgar bacilli which it lodges and which are ordinarily unable to produce any pathogeneous action.

One can understand how these secondary infections complicate the study of the diseases and what errors they may lead to.

Another important character common to most of the Pasteurella is their frequent localization on splanchnic or synovial serous membranes, in the subacute or chronic forms of the disease.

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There are many other points which are common to Pasteurelloses. A first attack, followed by recovery, confers *immunity*. It then seems that vaccination against Pasteurelloses must be easy. In reality it is a very difficult thing to obtain in the conditions of practice.

Attenuated cultures are easily obtained, but when they are to be applied extensively, great difficulties are in the way ; until lately the results obtained were incomplete and uncertain. Very recently Ligniéres has indicated a method of vaccination, very original in that sense that the vaccine shall be efficacious against all the Pastuerelloses.

He prepares this *polyvalent vaccine* as follows : Vials of Er-

lenmeyer containing a thin layer of peptone-bouillon where six different *Pasteurellas* have been introduced (sheep, beef, horse, swine, goat, chicken), are thus placed in the oven at 42°-43°; they remain in it for the first vaccine five days, and two only for the second. The attenuation which is thus obtained allows the inoculation, without danger, of animals of any species, breed or age.

The two vaccines are inoculated under the skin, at 12 or 15 days' interval, and in varying doses, according to the species and the weight, from one-eighth to one cubic centimetre.

If the predicted results are confirmed, Mr. Ligniéres will have solved, in a truly practical and unique manner, one of the most difficult problems of bacteriology.

Hyperimmunized animals against a given Pasteurella furnish an active serum against it. This fact has been proved by Kitt and by Leclainche for *chicken cholera;* by Kitt and Maye, de Schweinitz, Leclainche, and Wassermann for *Schweineseuche;* by Blin and Carougurn for the *Barbone* of buffaloes. Ligniéres has shown that the principles exist for all Pasteurelloses; he has seen, besides, that any antipasteurellic serum possesses a preventive and curative action against all Pasteurellas, slight but well marked.

To be sure, this action is much more marked towards the Pasteurella used for the production of the serum; nevertheless, the fact of the close relationship between all the Pasteurellas is once more demonstrated.

It was this which gave Ligniéres the idea to prepare a *polyvalent serum.*

Whether *mono* or *polyvalent*, any antipasteurellic serum is difficult and long to prepare; horses, which, notwithstanding the subject of selection, are very susceptible to Pasteurellas; during the immunization many subjects die, either by infection or by intoxication.

Therefore, one must go on slowly, carefully, use only small doses and renew the injection only after the animal is entirely over the effects of the preceding ones.

As immunizing products, Ligniéres uses mixed cultures of the six types of Pasteurellas, which he used to prepare his vaccine (these cultures have been kept up for several years in his laboratory and their virulence is slightly weakened by more than five hundred passages upon gelose).

To avoid all accident, he begins in vaccinating the horse, as I have said before, then he injects under his skin, every four or five days, doses of mixed cultures obtained in the oven at 35°, increasing little by little from five to twenty cubic centimetres; he does not go beyond that dose; at each inoculation the animal exhibits a very severe reaction, sometimes alarming, but it is of short duration; after two or three days, everything is in order.

The serum is both preventive and curative against all the Pasteurelloses; but the curative action is much more marked when the serum has been injected nearer the beginning of the disease; as soon as the secondary infections, so common and so dangerous in all Pasteurelloses, are present, the serum, still useful, is much less efficacious.

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Pasteurelloses attack all animal species; they bring close together and gather together affections whose relationship was not even suspected; and yet, on closer examination, one finds that all the pathological forms which have thus been grouped present striking analogies.

Indeed, in spite of the variety of affected species, the same processes are observed everywhere, giving rise to essential lesions which everywhere are identical. The similitude of the modes of development is such that the series of clinical and anatomical manifestations observed in the various species are often superposable, and that, sometimes, those which are missing in one series may have been foreseen and found again.

The constitution of this family, so remarkably homogeneous, not only shows the excellent value of the bacteriologic criterion in pathological classification; it furnishes also valuable information for epidermiology; it assists the genesis of contag-

ions and in a striking manner shows the passage from saprophytism to parasitism.

The etiology of Pasteurelloses is, indeed, one of the most interesting parts of their history.

Some Pasteurella are, so to speak, optional parasites; they can live in saprophytic conditions in external medias.

It is thus that, in 1881, Gaffky found in the water of the Panke a bacteria which, inoculated in the rabbit, gave it a septicæmia which was transmissible in series; this same bacteria of the *experimental septicæmia* of Gaffky was afterwards found by Smith and then by Thoinot and Masselin in the epidemics of *natural septicæmias;* it was a Pasteurella.

Pasteurellas are much diffused in external media; they are found in soils, waters, upon vegetables, in the digestive canal of healthy animals; some of those saprophytic forms are pathogenous at times, under more or less expressive conditions of receptivity.

Most of the infectious enteritises of birds, *wildseuche*, *rinderseuche*, *barbone*, *lombriz*, proved from an infection of saprophytic Pasteurellas, born in an external medium, and contagion plays only a secondary part or even none in their genesis.

In other Pasteurellas, the part of contagion appears little by little, and in some cases become predominating or exclusive. Septicæmia of rabbits, enteritis of birds due to saprophytic infection, may afterward be propagated by contagion and assume the character of true epizoötics; typhoid fever of horses, distemper of dogs, chicken cholera, appear but little outside of contagion.

First, occasional parasites, Pasteurellas may little by little become accustomed to this new parasitic life, and show themselves more and more apt to create new infections.

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Some etiological circumstances render these *rising contagions* peculiarly dangerous. The microbes, although having become clearly parasites, are still able, for a long time, to return to saprophytic life. And an epizoötic, which has been

smothered at great expense, is seen to reappear the following year without the possibility of accusing the importation of a new sick individual. On the contrary, the agents of well differentiated *old contagions*, are unable to return to this original state; they have become "parasites of necessity." Against those, measures of sanitary police are all powerful; they are difficult and uncertain with the former.

We already know, in veterinary medicine, a great number of well-defined Pasteurelloses.

The following table will give an idea of their importance to the economical point of view.

ANIMAL PASTEURELLOSES.

1. *Aviary Past.*— { Chicken cholera. / Aviary diphtheria.
2. *Past. of rabbits.*— { Septicæmia of rabbits. / Septicæmia of Beck. / Epizoötic rhinitis of Roger.
3. *Past. of guinea-pig.*—
4. *Past. of wild animals.*—(Wildseuche).
5. *Past. of sheep.*—(Pneumo-enteritis—lombriz).
6. *Past. of goat.*—(Infectious pneumonia).
7. *Past. of bovines.*— { Pneumo-enteritis (rinderseuche). / Septic pleuro-pneumonia of calves. / Diarrhœa of calves ("white scour"). / Entiqué.
8. *Past. of buffaloes.*—(Barbone).
9. *Past. of swine.*— { Contag. pneumonia, schweineseuche. / Swine pest or schweineseptikæmia.
10. *Past. of horses.*— { Typhoid affections (influenza). / Infectious pneumonia.
11. *Past. of dog.*— { Distemper of dog. / Typhus of dog (disease of Stuttgart).
12. *Past. of cat.*— { Distemper of cats. / Broncho-pneumonia of the cat of Siam.

It is not my intention to speak to you of all those diseases.

Chicken cholera, which is the type of the septicæmic Pasteurelloses, has been described to you, and later on you will know with *hog cholera* what relates to *swine plague.*

I will only say a few words on *lombriz of sheep*, *white scour of calves*, *typhoid affections and infectious pneumonia of horses.* These diseases, so different in appearances, have, however, many common points that I wish to bring before you to convince you of the great progress, scientific and practical, which the work of Ligniéres has allowed us to realize.

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Under the name of lombriz, in Argentina, a disease of sheep is known which every year kills many subjects. The disease attacks the young especially, shortly after their being weaned: it is manifested by weakness, loss of flesh, diarrhœa; then comes a cachectic condition, and when the animals die, they are true skeletons; there is very little fat, and this is soft; the meat is pale, flabby, atrophied and infiltrated with a clear serosity which is found all over in the subcutaneous and interstitial cellular tissue.

At post-mortem, most commonly, such large quantities of filiform, reddish, quick-moving worms are found in the abomasum that it is natural to consider them as the agents of the disease. Their reddish coloration is said to be the proof that they have sucked the blood through the thickness of the mucous membranes; their great number explains the progressive anæmia of the subject and the cachectic state which precedes death. The abomasum is not the only organ where worms are found; they may also be in the intestines; sometimes also in the bronchia, where they may be in great number. All this explains well the generally accepted opinion that the large mortality among the sheep is due to vermiform parasites, to lombriz.

Some veterinarians, however, had doubts upon the correctness of this etiology. If most part of the animals that die are extensively infested with worms, there are those which at post-mortem exhibit but a small number; there are even cases where none are found, and yet these, after, as well as before death, pre-

sented all the signs of the progressing cachexia which characterizes lombriz. On the other hand, nothing is more common than to find at the autopsy of fat and strong sheep which have never shown the slightest symptom of the disease, either in the abomasum or in the intestines, or in the lungs, very large numbers of those same worms.

Therefore, the disease may exist without worms, and again they may be there in great number and yet no disease be present. Conscientiously, then, it is not possible to consider the worms as the essential and necessary agents of the disease.

These facts being recognized, Ligniéres showed that the worms of the abomasum were strongyli (*S. contortus* and *S. instabilis*), parasites which are unable to implant themselves on the mucous membrane and suck the blood as other worms do, such as sclerostomas and especially ankylostomas. Ligniéres soon found that the red coloration of the worms was not due to blood that they had sucked, but to a peculiar pigment of their tissues, which disappears as soon as the worm, exposed to the air, stops moving. On the other hand, the constant integrity of the mucous membrane of the abomasum shows well that the worms which are swarming in its cavity were not implanted in its thickness.

These facts well established, Ligniéres was not so slow to observe that among the many sick animals presented to him, many gave general symptoms indicated especially by a great elevation in their temperature; out of those some died which did not have time to become cachectic, but, important fact, did show at the autopsy with or without worms in the abomasum or the lungs, distinct lesions of pneumonia, pleurisy, pericarditis or of arthritis.

This was an important point for him. These animals evidently died because of an infection to which the worms were entirely stranger.

The study of these lesions soon brought him to the discovery of a microbe, to which his preceding studies allowed him to attribute the essential part in the pathogeny of lombriz, exclusive-

ly of many and various other microbes which were found with it.

It is, indeed, a cocco-bacillus of the Pasteurella group, very close relation to the one that Ligniéres himself has demonstrated to be the cause of typhoid affections of horses.

The inoculation of this microbe will reproduce at will all the modalities that lombriz may assume in natural conditions.

* * *

If Ligniéres has succeeded so rapidly in solving this difficult problem, it is because he was marvellously prepared by his previous researches on the *typhoid affection* of horses.

Under this name is designated a serious infectious disease. All veterinarians know well its proteiform character, and its clinical manifestations, so numerous and so varied in appearance. Its scientific study, full of difficulties, had discouraged all those who had attempted it.

I must acknowledge that when Ligniéres spoke to me of his intention to undertake that work, I tried to dissuade him. "It is an ink bottle," said I; "you will be drowned in it; so many others, better qualified, have lost their time and found nothing." I could not stop him. With his characteristic strong mind, his earnestness and power of work, Ligniéres started, and, after three years of stubborn efforts, he succeeded in finding out what typhoid affection was. I still remember his joy and the astonishment of our colleagues when for the first time Ligniéres told us that he would give typhoid fever to a healthy horse, and kill him inside of 48 hours with a fulminant form of the disease. He did what he promised. And, eight hours after the injection of a small quantity of culture, the animal had all the most marked symptoms of the disease and died twenty hours later, with the classical lesions of typhoid affection. And, then, he created before us, I might say at will, all the other forms of the disease—pneumonia, pleurisy, pericarditis, enteritis, arthritis, meningitis and even ophthalmia, all of typhoid nature.

This typhic microbe, which had until then escaped all researches, is a cocco-bacillus analogous to that of lombriz, equally dangerous by its toxines, which place the organism in condition

of receptivity for all the secondary infections proceeding from the lungs or the intestine; it is as delicate as that of lombriz; as difficult to isolate from lesions a little old, where in return a great number of ordinary microbes pullulate and for which he has marvellously prepared the ground of culture.

* * *

Diarrhœa of newly-born calves is sometimes a true calamity; it is principally severe in the south of Ireland, where it kills more than half of the calves born. Most of them die in a few days in the week that follows birth, after having had a white, foaming, incoercible diarrhœa called "*white scour*"; others, in small number, recovered from this diarrhœa, die later, in two or three months, after having exhibited more or less marked symptoms of a disease of the chest; at the post-mortem are found numerous or extensive centres of the pulmonary tissues, which are caseous or suppurating; this is what Irishmen called the "*lung disease.*"

These diseases, apparently so different, have, nevertheless, a close relationship. *Lung disease* is observed only on farms infected with "*white scour*," and farmers know well that calves recovered of this last disease are, so to speak, condemned to die with the other, the lung disease.

Having been asked by the Agricultural Department of Ireland to study these serious diseases, I was able to show that, contrary to the opinion generally accepted, which attributed them to a coli-bacillar infection (Jensen), "*white scour*" and "*lung disease*" were but complications of a primitive pasteurellic infection, by umbilical infection. The demonstration, however, was rather hard.

Indeed, if almost all the calves affected with "*white scour*" die, the duration of the disease varies very much.

Most often, death occurs only after several days (from 3, 6 to 8 days), following an intense intestinal discharge; the fæces, expelled at every instant, are diarrhœic, white, foaming; the animals lose flesh rapidly; the flank is hollowed, abdomen retracted, loins arched, eyes sunken deep, hair dull and staring; the beasts

strain violently and moan; the temperature, generally higher than normal, drops suddenly towards death, and the animals remain stretched on the ground or on their excrements, unable to rise or to stand.

At times, the calf dies the very day or the next after birth, without having exhibited the ordinary signs of the disease; it seems as if diarrhœa had not had time to appear.

In other cases, though rare, the symptoms are less pronounced and the animals resist; but recovery is only apparent, and the subjects which seemed cured succumb a few weeks later to pulmonary lesions (lung disease).

Finally in others, different symptoms, less constant, but no less important, are observed; it is not rare to see, *in cases with rapid evolution*, the diarrhœic matters mixed with a varying quantity of blood. The *slow forms* of the disease are frequently accompanied with acute arthritis or synovitis, multiple and very painful.

The lesions found at the post-mortem are those of an hæmorrhagic septicæmia, whose severity varies much, according to the rapidity of the disease; there is one which is never missing; it is located on the umbilicus and the umbilical blood vessels.

The bacteriologic study of these lesions shows them to be invaded with a great number of various microbian species. Whatever may be the origin of the culture—blood from the heart or umbilical clots, liver, spleen, kidneys, lymphatic glands—all the medias, liquid or solid, which have received it, gave abundant growth of various microbes, among which different varieties of coli-bacilli much predominate.

However, in the cases with a very acute march, which are studied immediately after death, the blood from the heart gives pure or nearly pure cultures of a *Pasteurella*, which experimental study permits us to consider as the specific agent of the infection. The same *Pasteurella* is found, more or less readily, in all the other forms of the disease, principally in the articular exudates, when they are present.

The intravenous inoculation of a small quantity of this Pasteurella will be followed by an exact reproduction of the clinical and necroscopic manifestation of the acute forms of "*white scour*"; nothing will be missing, except the umbilical lesions; those can be easily obtained at the same time the others are; all that is required for it is to rub the umbilical wound of a newly-born calf with a little of the culture of the Pasteurella—(Moussu, Lesage and Delmer.)

Whatever may be the door of entrance of the specific microbe, it pullulates in the organism, and gives rise to a general infection, which may kill the calf in a few hours: it is then a *pure Pasteurellose*, in septicæmic form; if the subject resists several days, which is the rule, the organism, deprived of its means of defence by the paralyzing action of the toxines of the Pasteurella, becomes the prey of numerous secondary infections, proceeding from the lung and specially from the intestines; hence the various manifestations of "*white scour*"; finally, in the rare cases where the subject resists the intestinal infection and recovers from "*white scour*" the pulmonary infection keeps on in its slow development and finally ends in establishing the massive lesions which characterize the "*lung disease.*"

Like similar affections which prevail a little all over the world, "*white scour*" proceeds from an umbilical infection; it takes place at the time of birth, through the wound resulting from the rupture of the cord; it is comparatively easy to prevent it by disinfection of the umbilicus immediately after birth and closing the door of entrance with a thick coat of antiseptic collodion.

This simple treatment has already given excellent results, not only in Ireland, but in Scotland, France and Belgium.

* * *

Under the name of *infectious pneumonia*, veterinarians designate a variety of pneumonia which often prevails in large stables under an epizoötic form.

Schutz had isolated from it a bacteria, taking the Gram, often associated two by two, which for a long time has been con-

sidered as the agent of the disease. MM. Chautemesse and Delamotte, during an epizoötic among some artillery horses, had isolated from an hepatized lung, a streptococcus which they considered as specific.

Ligniéres, undertaking that study, first showed that the diplobacteria of Schutz was nothing else but a very short streptococcus which, with that of Chautemesse and Delamotte, he proved to be identical to the streptococcus of distemper in the horse. Then, by a series of researches, truly wonderful in their ingeniosity, he showed that this streptococcus of distemper, always present in the respiratory tract of healthy horses, did invade the hepatized lung only under the influence of the organic depression produced by the toxines of a Pasteurella identical to that of typhoid fever. Here, again, the secondary infection which impresses on the pulmonary lesion its specific characters, most often conceals the primitive, which is, however, the indispensable condition of its apparition.

* * *

By these few examples, taken among many others, one can judge of the important part played by Pasteurellas in a great number of serious diseases and also of the new horizon that opens to us the notion of a group of microbes whose most constant characteristic is to assist and promote the invasion of the organism by a multitude of vulgar microbes, ordinarily harmless, which proceed from the lung or the intestine.

I do not think that I advance too much in saying that this new notion, which has already given such handsome results in veterinary pathology, will give just as fine ones when it is applied to the study of the diseases of man.

WE acknowledge with thanks a kind Christmas remembrance in the shape of a most unique paper-cutter from that loyal veterinarian, Dr. W. T. Monsarrat, of Honolulu, Hawaii. We trust we may frequently have occasion to use it in opening communications from him for REVIEW readers, as there are many interesting topics in his delightful country that would make splendid reading for our American subscribers.

ROBERT KOCH AND HIS CRITICS.

A STUDY IN THE CONTROVERSY OVER INTERCOMMUNICABILITY OF TUBERCULOSIS.

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PART I.

THE CONTROVERSY OVER INTERCOMMUNICABILITY OF THE DISEASE.

(1) *Koch's statements of July 27, 1901, and the immediate results.*

Whatever may be the conclusions of the future on the transmissibility of the disease, the 27th day of July, 1901, will be forever memorable in the history of tuberculosis, for it was then that Geheimrath Professor Koch, of Berlin, gave the results of his most recent studies in tuberculosis. From a consideration of these results the bald conclusion was reached by the medical press: (1) That human tuberculosis was not transmissible to cattle; (2) nor that of cattle to man; and, (3) there was no need of such strict sanitary precautions against the conveyance to man of the disease through milk and meat. In 1901 Koch wrote for his speech before the London Congress: "A number of young cattle which had stood the tuberculin test, and might therefore be regarded as free from tuberculosis, were infected in various ways with pure cultures of tuberculosis bacilli taken from cases of human tuberculosis; some of them got the sputum of consumptive patients direct. In some cases the tuberculosis bacilli or the sputum were injected under the skin; in others into the peritoneal cavity; in others into the jugular vein. Six animals were fed with tubercular sputum almost daily for seven or eight months; four repeatedly inhaled great quantities of bacilli which were distributed in water and scattered with it in the form of spray. None of these cattle (there were 19 of them) showed any symptom of disease, and they gained considerably in weight. From six to eight months after the beginning

of the experiments they were killed. In their internal organs not a trace of tuberculosis was found. Only at the places where injections had been made small suppurative foci had formed, in which few tuberculosis bacilli could be found. This is exactly what one finds when one injects dead bacilli under the skin of animals liable to contagion. So the animals we experimented upon were affected by the living bacilli exactly as they would have been by dead ones; they were absolutely insusceptible to them.

"The results were wholly different, however, when the same experiment was made on cattle free from tuberculosis with tubercle bacilli that came from the lungs of an animal suffering from bacillus tuberculosis, after an incubation period of about a week. The severest tubercular disorders of the internal organs broke out in all the infected animals. It was all one whether the infecting matter was injected under the skin, or into the peritoneal cavity, or the vascular system. High fever set in and the animals became weak and thin; some of them died after a month and a half or two months. After death, extensive tubercular infiltrations were found at the place where inoculations had been made, and in the neighboring lymphatic glands, and also far advanced alterations of the internal organs, especially the lungs and the spleen. In the cases in which the injection had been made into the peritoneal cavity, the tubercular growths which are so characteristic of bovine tuberculosis were found on the omentum and peritoneum. In short, the cattle proved just as susceptible to infection by the bacillus of bovine tuberculosis as they had proved insusceptible to the infection of human tuberculosis." *

Such were Koch's statements in 1901. How different were his observations in 1882, when he issued his classic work on "The Etiology of Tuberculosis," may be seen from the following, taken from the *Berliner Klinische Wochenschrift* of that year: † "Tuberculosis of the domestic animals," he says, "and

*Vide *Lancet* II., 1901, or AMERICAN VETERINARY REVIEW, 1901.

† *Berliner Klin. Woch.*, 1882. P. 230.

especially bovine tuberculosis is undoubtedly another source of infection. This fact indicates the position which, in the future, hygiene must take in connection with the danger of the flesh and milk of tuberculous animals. Bovine tuberculosis is identical with human tuberculosis, and is thus a disease transmissible to man. It must therefore be treated like other infectious diseases transmissible from animals to human beings. Be the danger which arises from the consumption of the flesh or milk of tuberculous cattle ever so great or ever so small, it exists, and it must therefore be prevented. It is sufficiently well known that anthrax flesh is often consumed by many persons for a long time without any injury resulting, and yet no one concludes therefore that the traffic in such flesh ought to be permitted."

"With regard to the milk of tuberculous cows, it is worthy of remark, that the extension of the tuberculous process to the mammary glands is not seldom observed by veterinary surgeons, and is therefore quite possible that in such cases the tuberculous virus may be immediately mixed with the milk."

(2) *Koch's modifications of statements made at the Congress in London.*

As men had in mind these utterances of Koch in 1882, which, together with the results of his investigations at that time, had largely tended to rear sanitary law against the dread disease and had set in motion preventive measures, they were indeed alarmed for public safety at the nullifying statements of 1901. Indeed, the celebrated bacteriologist was constrained to salve the disquieted public by issuing a modified statement almost immediately, August 24, 1901. He said: "I have no claim to either priority nor monopoly to my ideas propounded in the address, but I sought only to tell of my own private experiments, and was, in fact, glad of the opportunity given to mention my contemporaries in some of their experiments, among whom was one of America's greatest medical authorities, Dr. Theobald Smith." Regarding the danger of infection from tuberculous cattle he had said: "I should estimate the extension

of infection by the milk and flesh of tuberculous cattle, and the butter made from their milk, as hardly greater than that of hereditary transmission, and I therefore do not deem it advisable to take any measures against it." He now in his modified statement said: "I did not mean to recommend the abandonment of comprehensive and expensive systems of regulation, prevention and inspection that are now in operation. I simply said that it was injurious and unnecessary to go further with such systems when we were justified in expecting that our life-long remedy was found and almost within reach. Why, then, should we rear higher structures which must inevitably fall to the ground." *

(3) *The first outburst against Koch: criticism of his hastiness, false inferences from experiments and the evil effect of his premature statement.*

It is the pride of men of science that they hold such an allegiance to truth that they must sacrifice any previous statement based on what facts they had in hand, when they have obtained fuller knowledge. They must do this whether the new knowledge they have obtained flatly contradicts any previous statement. That man is bold who will do this, as Koch did, when he knows his previous dicta are held as truth by well-nigh the whole scientific world. Nevertheless the first outburst against Koch in 1901 was, I think, justified when it was urged that his judgments were hasty, that the inferences from his experiments were partly, at least, false, that his experiments were insufficient to demonstrate the conclusions he reached and that his premature and ill-advised statements would have an evil effect. Ravenel of the University of Pennsylvania, himself a delegate to the London Congress, wrote to the editor of the *Philadelphia Medical Journal:* † "The sensation of the meeting was Koch's ill-advised and unfounded dictum on the uselessness of the precautions against the transmission of bovine tuberculosis to man. It has raised universal opposition among those who *work*. Lord

* *Medical Record*, 1901. P. 301. Aug. 24, 1901.
† Aug. 24, 1901. P. 284.

Lister followed him in a strong protest against his conclusions, and after him Nocard, Bang and Sims Woodhead. The next day at the general meeting, Professor McFadyean read his paper. I think he demonstrated the fallacy of Koch's views. I have spoken to many men of almost all nations and all condemn the method of his announcement, as well as the insufficiency of his grounds. I am told on responsible authority that even the Germans are against Koch's view. All the papers read by the German delegates showed that they held views opposed to Koch. . . . . I have visited the State Veterinary School at Brussels and spoken with most of the leading men there. Without exception they oppose Koch's views, and Professor Gratia said to me, 'He has made *trouble for all the world.*'"

In the same vein the *New York Medical Record*, under the caption "Koch's Alleged Discovery" said, "How great the harm may be, if Koch is wrong, may be judged by the head-lines in the New York *Herald*, July 27, 1901, 'Professor Koch's New Discovery—Bovine Tuberculosis Not Transmissible to Man, and Very General Fear Unfounded—No Harm to Use Milk or Meat—Diet, from Infected Cattle, German Bacteriologist Holds, Can be Consumed with Impunity.'" The *Medical Record* continues, "the keen searching after exactness of the scientist has been dulled in Koch more or less, as was shown in the matter of tuberculin . . . . . and in that of his assertions regarding malaria. He has lost the caution of the real scientist and has put on the assumption (the cocksureness we are tempted to say) of the *poseur*. He asserts with positiveness what men like Adami and Theobald Smith suggest with caution. . . . . Theobald Smith, in 1898, made a communication to the Association of American Physicians in which he described a number of experiments showing marked differences between the bacilli and those of bovine tuberculosis. The differences were morphological cultural and the results of inoculation, and were sufficient to warrant the belief that the diseases were distinct though possibly allied affections. He gave as his opinion 'the occasional entrance of bovine bacilli

into the human body might open the way for the introduction of a virus of a higher level.' Adami also, while not denying the possibility, and indeed arguing that it should be accepted for prudential reasons, yet admits that the evidence of direct transmission from animal to animal 'is singularly slight.'"

In thus speaking of the work of Theobald Smith and Adami, and it well might have mentioned others well-nigh as important, the *Medical Record* touched upon one of the chief faults of Koch—his unwillingness to fully and honestly accredit the work of others in the same field of labor. And no less a person than Adami himself scores him for this form of dishonesty. In the *Canadian Journal of Medicine and Surgery** he said: "It is very possible, and it happens not infrequently, that an active worker and writer occasionally, and by accident fails to credit his fellow-workers; but when the failure to acknowledge the observations of others is frequently repeated, no excuse can be asked or can be accepted. Either the individual who commits the crime is absolutely callous and has callously determined to aggrandize himself at the expense of others, or he suffers from a form of disease—megalomania, by which we mean that such an individual becomes so full of his subject and of himself that he regards every fact and every idea as his own whether the idea has previously been enunciated, or is the natural and independent development of his own line of work and thought, or has been, in the first place, obtained from the work and writing of others. We are inclined to think that the second is the more probable explanation in the case of Professor Koch. When, for example, he announced the discovery of tuberculin he has not a word to say with regard to the observations of other workers who had previously investigated the action of the products of the growth of the tubercle bacillus, among whom I may mention Crookshank of London, and, if I mistake not, Büchner of Munich. He took all the credit to himself. When next he described (and described imperfectly) his method of the preparation of tuberculin, no credit

*See *Med. Rec.*, Nov. 23, 1901, or *Canad. Jour. of Med. and Surg.*, Oct., 1901.

was given to Roux or Nocard for the discovery that the tubercle bacillus would grow in media to which glycerin had been added, glycerinized broth being the medium from which he prepared the tuberculin. When, later, he gave his observations on the chemical nature of tuberculin not a word was said about the previous observations of Hunter and others who had before him reached practically identical results, and, indeed, had made further researches. Only recently, taking up the subject of malaria, he has had the hardihood to take to himself all the credit for the discovery and the important part played by mosquitoes in the propagation of this disease and has refrained from saying a word of due praise concerning the prior observations of Ross, and Italian and yet earlier American workers. These facts are well known to those conversant with bacteriological literature, but such is Professor Koch's power and influence in Germany that younger men dare not disclose these matters in the public press for fear lest their careers should be injured while his colleagues of professional rank say nothing about the matter fearing lest their motive should be considered one of jealousy. It is left to those of other nationalities to bring forward these facts unpleasant as they are."

Great as have been his accomplishments as a bacteriologist, these impeachments of Koch as a scientist and as a man by leaders in Canada and the United States in the same field of labor, give us a key to the understanding of his weaknesses and failures. Vanity, which is a common blemish of many minds, otherwise great, led him to take the occasion of the London Congress to voice opinions as hasty in themselves as they were alarming to the public. There is no doubt now that the data upon which he grounded his conclusions were insufficient. Just as in 1882 the students of tuberculosis had readily accepted his conclusions, so now in 1901 they as readily denied his new dictum.

(4) *The appointment of King's commissioners on tuberculosis: questions to be studied by them: character of the appointees.*

How great was the alarm in the country in which the pro-

nouncements were made, is evidenced by the immediate appointment by Edward VII of a King's Commissioners on Tuberculosis to inquire and report: 1, Whether the disease, tuberculosis, in animals and man is one and the same; 2, whether animals and man can be reciprocally infected with it; 3, under what conditions, if at all, the transmission of the disease from animals to man takes place, and what are the circumstances favorable and unfavorable to such transmission.* To this commission was appointed Sir Michael Foster, the physiologist, who "with his unrivalled and encyclopædic knowledge and with his matured judgment is a tower of strength"; Drs. Sidney Martin and Sims Woodhead, who "as representing the clinical and laboratory aspects of the inquiry" might well be depended on to gauge the nature of all the practical operations involved in an experimental inquiry; Professor McFadyean, the Principal of the Royal Veterinary College, London, who would add his special knowledge of bovine tuberculosis; and Professor Rupert Bryce with his business capacity and technical laboratory knowledge.† The answers to the explicit questions set to them, as the London press observed, involved some of the gravest questions in infection. What is the difference between a natural infection and an experimental inoculated disease? In both instances, under presumably favorable conditions for infection, the margin of failure is notoriously wide. It is possibly associated with the degree of natural resistance or relative immunity exercised by the host towards the invading parasite. Perhaps the degree of resistance may be connected with the particular breed of animal, with its food, or with its hygienic surroundings. Again, it would be of importance to possess some accurate information on the *limits* of morphological and physiological variations possessed by the tubercle bacillus. What is its natural distribution and what are its relationships, if any, with certain other organisms of closely allied morphological structure? ‡

Closely following, and in some cases accompanying, the crit-

* *Med. Record*, 1901 P. 501. Sept. 28, 1901.
† Vide *Lancet* II, 1901. P. 738.
‡ Supra cito.

icism of the character of Koch came the criticism of the contents of his speech. These criticisms emanating under their own signature from the leading savants in Germany, France, Great Britain, Canada and the United States, together constitute a fusillade of questionings such as seldom appear from the scientific body of searchers after truth. There is in them a questioning of methods, a revaluation of data, a keenness of dialectic which cast doubt on the work of Koch, in this particular, from every view-point. There was not wanting men like Rudolph Virchow, that superb figure in pathological science, to point out his errors in pathological histology, like von Baumgarten to show his errors in pathogenesis, like Ferdinand Hüppe who disputed his bacteriological interpretations, like McFadyean who demonstrated the fallacy of his reasoning, like Lister who explained that his hypothesis was groundless, like Copeman who saw Koch's omissions, like Nocard who denounced him for belittling the dangers from bovine tuberculosis.

(5) *The criticism of Koch's statements.*

(A) IN GERMANY.

R. Virchow.

Rudolph Virchow, at the time Koch made his statements, was a Professor in Berlin and unrivalled throughout Germany, and the world for that matter, in pathology. Of Koch's enunciations he said, "On the whole I do not agree with him. In a discourse which I recently gave at a meeting of the Berliner Medicinische Gesellschaft I left no doubt concerning my standpoint on the matter. I would point out that Koch, in summarizing the results of his investigations, disregarded the conclusions for which we are indebted to the Copenhagen School. . . . . I may refer to our enactments concerning quarantine; for example, in illustration of our indebtedness to the scientific work of the Copenhagen School. The conclusions arrived at by the Danish scientists are very different in character from those of Professor Koch. The question is anything but settled." * In

* *Berliner Lokal Anzeiger*, July 26, 1901.

the *Berliner Klin. Woch.** Virchow wrote: "I will only observe in this connection that Professor Koch has perhaps gone too far in the exclusion of all those cases in which transmission of bovine tuberculosis to man, might possibly have taken place through food. As a matter of fact we have had from time to time an occasional case in the material of the Charité Hospital, and several specimens have been preserved which showed a very unusual evidence of peritoneal tuberculosis and in which there were formed such enormous growths as do not usually appear in man. We have regarded each case with suspicion, and we shall continue to do so. Therefore I deem it possible that the negation of Koch may perhaps admit of refutation in the future." Besides, Virchow denounces Koch's loose manner of pronouncing pathological growths tubercles without minute examination. "I might remark here that it seems to me that we cannot call anything tuberculosis in which tubercles do not grow in that form by which they prove themselves pathologic—anatomically, true tubercles; but not everything in which tubercle-bacilli are found should be called a tubercle offhand. . . . . In this connection I take liberty again of emphasizing to you that, according to my conception, a tubercle is not merely a thing in which there are tubercle bacilli, but is built up of cells which are called tubercle cells, that is, there is present in the tubercle an organization of structure which has grown out of its own body even though it may have arisen by the irritation of tubercle bacilli. But tubercle bacilli are not a productive (formative) element in themselves; the formative element must be cells which have been produced from the living body itself. * * * * The difficulty in the way of a clear differentiation is principally that we believed we could call a structure containing the bacilli in question a tubercle without further investigation. . . . . Even the anatomical *wart* has been considered a tubercle because here and there a tubercle bacillus had by chance been found in microscopical sections of an anatomical excrescence of the skin."

* Aug. 5, 1901.

Von Baumgarten.

Professor P. von Baumgarten of Tübingen, an authority on the biogenesis and morphology of the tubercle bacillus, has written much of late on the relation between human and bovine tuberculosis. In part he agrees with Koch, but on the whole the drift of his thought is in opposition to him. In the *Berliner Klinische Wochenschrift* * he says: From a number of experiments by himself and Dr. Gaiser, and because of a critical study of all the literature, he comes to the conclusion, thus far no absolutely unimpeachable instance of successful transmission of human tuberculosis to cattle has been recorded. Twenty years ago Rokitansky in his Institüt had attempted to verify his ideas on bacterio-therapy, *i. e.*, the experiment of healing otherwise hopeless patients by the inoculation of certain bacteria. Since that time, in many instances of malignant disease in human beings, attempts had been made to cure by inoculation, for example, of virulent cultures of erysipelas.

In six selected cases of hopeless malignant tumor Rokitansky had tried the experiment of inoculating tuberculosis to see if the diseases contracted one another. At that time the idea was current that human and bovine tuberculosis were identical. They happened to have no virulent cultures of human bacilli available, so they used perle disease bacilli, which had been proven highly virulent for rabbits. Although considerable quantities of tubercle bacilli were injected subcutaneously, there was no infection—nothing of a tuberculous nature either local or generalized was observable. Most critical microscopic and macroscopic examinations of the adjacent lymph glands, as well as of the tissues of the different organs through which the malignant disease had become disseminated, failed to reveal tubercles or tubercle bacilli. These inoculations of human subjects with highly virulent perle disease bacilli proved as negative as did Professor Koch's inoculation of cattle with human bacilli, though most of the human subjects under consideration survived inoculation from several months to over a year. For a

* No. 35—Sept. 2, 1901.

long time now the teaching of Rokitansky of the exclusion of tuberculosis by carcinoma has been abandoned.

However, in spite of the fact that the above experiments were negative, he says the identity of the two diseases should not be ignored without futher investigation of the subject, because: (1) Acute miliary tuberculosis can be produced in cattle by infection with bovine tuberculosis, the same as it occurs in man from human tuberculosis, cannot be doubted by morphologists; (2) by certain external influences (iodoform vapor) the human tubercle bacillus can be modified in its pathogenic power as to produce the typical form of perle disease in the rabbit has been demonstrated by Fangl and Troje. It follows that the bacillus from perle disease can cause typical miliary tuberculosis and that human tubercle bacilli can produce the characteristic form of perle disease. (3) The bacilli of human and bovine tuberculosis are morphologically and culturally identical. (4) Pathogenic power is well known to be one of the most variable characteristics of pathogenic bacteria. He has seen pure cultures of human tuberculosis which showed rapid growths upon glycerine-agar and upon potato soil, but which, nevertheless, were powerless to infect the smallest rabbit, though in former generations they invariably caused the death of rabbits and guinea-pigs. (5) Pathogenicity can be often increased by passing the bacilli through different animals. In rabbits the virulence of tubercle bacilli derived from bovines can be increased by successively passing them from animal to animal. (6) The bacilli of man and ox may be attenuated from long sojourn in chicken. The bacilli which have for countless generations perpetuated themselves in bovine or human organisms, have thereby acquired that which render impossible their propagation in a soil to which they have become strangers. Von Baumgarten prefers, therefore, to accept the view of Lister and Nocard rather than the less tenable doctrine that in different species of animals we have to deal with different species of tubercle bacilli which are sharply and permanently differentiated from each other and not transferable. Though he has never

considered the danger from animal food very great, yet he thinks the measures of prevention should not be relaxed.

In a more recent paper, written as late as January, 1903, in the *Journal of Tuberculosis*, he speaks of the instability of any doctrine of transferability or non-transferability in Germany. The degree of importance attached to the relation between human tubercle bacilli and bovine tubercle bacilli, he says, is witnessed by the fact that The Imperial Health Bureau in Berlin has inaugurated the control of the experiments of Professors Koch and Schütz upon a large scale. The plan of these experiments was formulated last spring with the coöperation of many tuberculosis experts, and they are now in full progress. In other hygienic and pathological laboratories investigations of the subject are being diligently carried out. Such experiments, for which especially, appropriations have been made, are also in progress in von Baumgarten's Institute at Tübingen.

The chief object of all these experiments will undoubtedly be to determine whether, by the inoculation of calves with human tubercle bacilli from as many different sources as possible, and more particularly from primary tuberculosis of the intestinal tract, under any circumstances, the transmission of human tuberculosis to cattle is possible.

F. Hüppe.

No greater acumen has been shown by anyone; neither has a more perspicuous argument couched in the most pungent phraseology been brought forward than in the criticisms of Ferdinand Hüppe, the celebrated Austrian bacteriologist. He has written two scathing reviews on Koch's position, one called "Tuberculosis, Bovine and Human,"* the other "View-points and Problems in the Study of Tuberculosis."† At one time, he says, the public peace of mind is disturbed by the display of the heaviest scientific artillery, backed by conclusive laboratory experiments, and then all at once the public peace of mind is again disturbed by still more conclusive laboratory experiments prov-

* *Lancet* II, 1901. August 31, 1901.

† Wien. Med. Woch., 1902, 1 and 2.

ing the very opposite. It cannot be known whether Koch's inference was premature because the experiments were not carried far enough. . . . . The breed of the cattle that the human bacilli did not effect is still to be precisely ascertained. Even in this matter one must proceed cautiously. When it was proved by the researches of Bollinger, Vitt and myself that what had been previously regarded as splenic fever of swine was a different septicæmia produced by quite a different bacterium, the opinion was entertained that splenic fever did not affect the pig, and yet some breeds may be successfully inoculated with the disease. . . . . The accounts that have hitherto been made public lead me to believe that Koch's experiments have not been carried far enough to justify his conclusions, and I must expressly keep open the possibility that the human tubercle bacillus may, perhaps, be able to infect some breeds of cattle, especially as before the discovery of the tubercle bacillus, Bollinger had once with tubercular material from the human subject produced true bovine tuberculosis in the calf. . . . . Koch once more draws all the fallacious inferences which arise from regarding an inoculated disease as a natural infection. And yet these things have little to do with one another, as we know from a laborious work of 40 years. The tubercle bacillus of man has no hold on the ox, consequently the tubercle bacillus of man and the ox are different species! It is the same fallacious inference as Mafucci and Koch arrived at in connection with the difference of bacteria of mammalian and avian tuberculosis. These bacteria really show in their cultures distinct differences such as are not found in bacilli of different species occurring in mammals. Nevertheless they belong to one species as obvious modifications dependent on differences of nutrition and situation. F. Feschel and myself have by purely cultural methods changed the one modification into the other, and have so altered them that mammalian tuberculosis took effect in fowls and the bacilli of avian tuberculosis took effect on mammals.

In his more mature thought on View-points and Problems in Tuberculosis, he writes in 1902: Whoever thinks of noth-

ing but bacilli in this warfare has already missed the connection between the latter and the social problems of hygiene. Other circles besides our own have come to a clear understanding that one must consider the tuberculous individual himself along with a study of the bacteria in the case. Baumgarten, for instance, still looks at matters from the purely bacteriological standpoint; for he regards the differences in the histological structure of tubercle as dependant purely upon the virulence of the bacteria and looks upon slight virulence as equalizable only through an increase in the number of bacilli. . . . . Thus far we possess no means of fashioning the virulence of the tubercle bacilli at pleasure and can neither increase nor decrease virulence. On the other hand we often obtain our first idea of virulence from the histological findings. . . . . No one has ever counted the living bacilli and our quantitative appreciation of the germ has been in connection with dried bacilli, only partly controlled. We do not know how many of the latter are dead or non-virulent. Nor can we determine how many are alive and infectious. . . . . Virulence is only a relative term and does not comprise all the factors which are of importance for an act of infection. The infectiousness of a pathological microörganism depends on the entire metabolism in relation to the species of its host. . . . . A tubercle is an anatomical nodule which may be produced by the most heterogeneous irritants and which demonstrates nothing beyond the fact that the mechanical makings of the tissue is especially adapted for the formation of nodules. But the subject of tubercles does not exhaust tuberculosis; nor do retrograde metamorphoses, caseation and calcification; for in the same lung along with tubercles, caseation and calcification, there occur superficial, exudative inflammatory processes, as Orth has recently told us. . . . . Koch will see nothing that has happened in the last twenty years; he does not, will not know anything but the bacillus. The bacillus is everything. . . . . My personal material shows that from 25-30 per cent. of all deaths from infantile tuberculosis are due to intestinal localization. Professor Heller of Kiel has the same percentages. It

appears therefore certain that by far the greater number of cases in children come from tuberculous cows.

The opinions of Rudolph Virchow, Professor von Baumgarten and Ferdinand Hüppe represent well German thought of to-day on the disease. Clearly it is not in accord with that of Koch. We shall see that the French are as much opposed to Koch as the Germans themselves.

(B) IN FRANCE.

Nocard.

From the leading veterinary school in France and from its most famous professor we would expect an answer to Koch, whether the answer contain similar views or not. Small wonder is it that Nocard stands staunchly against Koch, whose thought does not at all tally with his observations and experiments. In Nocard's latest paper, written late in 1902,* we may find his most recent thought.

"*Variation in Virulence of Bovine Tuberculosis.*—It was known that the ox in health is resistant to human tuberculosis; attempts at inoculation fail most frequently; but they succeed sometimes, and then the lesions are analogous to the natural form of the disease. . . . . For my part I have experimented with cultures of human tuberculosis of three different origins. All three were virulent for guinea-pigs and rabbits; one of them killed quickly sheep, goats and young pigs, by intravenous inoculation of a feeble dilution. I have not succeeded in killing a single healthy bovine, whether by intravenous inoculation, by injection into the mammary gland during lactation, or by ingestion of notable quantities of these cultures. However, Thomassen, Ravenel, Karlinski, Delépine, Arloing, Klebs et Rievel, de Jong, Pretlner, Schottelius, Max Wolff, Fibinger et Jensen and others have brought forward new examples of human tuberculosis transmissible to bovines. For the formula of Koch 'The ox is refractory to human tuberculosis,' it becomes necessary to substitute this: the ox is refrac-

* *La Revue Générale de Méd. Vétér.*, vide, *Vet. Record*, Jan. 17, 1903.

tory to certain strains of human tuberculosis, whilst it is receptive to certain others. This amounts to saying that there is not *a* human tubercle bacillus but several of widely varying virulence amongst which are some which overcome the really considerable resistance of the bovine. And the same may be said of other forms of tuberculosis. In bovines one finds bacilli of varied virulence even for cattle. Some induce a generalized infection ending fatally in a few weeks, some give rise to only a few local lesions which develop only very slowly, and which remain for months and years compatible with all the appearance of health. If, then, one works with a single type, taken from one source only, the results obtained, however numerous the experiments, have only the restricted value of an isolated experiment. With our present knowledge it seems well established that the difference of virulence observed between the tubercle bacilli of the different species point to a gradual adaptation more or less complete to their environment."

"*Transmission by Milk.*—Milk, like flesh, is rarely dangerous at all, except when it comes from a tuberculous udder, but in that case it is highly dangerous for it may contain immense quantities of bacilli. M. Koch does not admit the reality of this danger; against the frequency of the bacilli in milk and butter on sale in towns, he sets the extreme rarity of primary intestinal tuberculosis — the only lesion, according to him, which indicates an infection of alimentary origin. . . . . The contention that primary intestinal tuberculosis is the only indication of alimentary infection can no longer be admitted. All who have experimented know that the bacillus may invade the mucous membranes at any point. Tuberculosis of the tongue, of the sub-maxillaries, the sub-glossal and sub-pharyngeal glands proceed most frequently from an inoculation of the bucco-pharyngeal membranes. In the guinea-pig this is the principal seat of infection from food. Almost always ulcerations of the pharynx are found, whence the bacillus invades successfully the whole chain of glands. In the majority of cases the parotidean or cervical are attacked in the calf, pig,

cat, rabbit, when fed on tuberculous material. And when abdominal tuberculosis is slowly developing, it is not surprising to find lesions of lungs and bronchial glands."

Arloing.

After Nocard, there is no man in France who knows as much about bovine tuberculosis as M. S. Arloing, of Lyons. His experiments are as careful and as ingenious as those of Nocard, and the two scientists are often coupled together in medical literature, as equals in research. Shortly after Koch's speech he wrote an elaborate review in the *Revue de la Tuberculose*, August 1901, in which he concludes: (1) The criticism arrived at by M. le Professeur Koch, when he declared that human tuberculosis was different from bovine tuberculosis, is too rigorous. (2) The facts that I have recalled from my experiments with the ass and the goat, demonstrate that the virulence of the bacillus of tuberculosis is frequently modified in the organism of a special animal, and also that it adapts itself to this or that living medium by a series of successive transmissions. (3) Consequently one should expect to find between the B. of Koch established upon diverse species of animals, differences and peculiar changes in their virulence. (4) But these variations do not change the fundamental property of the bacillus, which is able always to return at one moment or another to a typical intensity. (5) M. Koch has as much as admitted this in his experiments when attempting to infect the pig. (6) The learned author is right when he says many experiments should be performed before positive results can be reached. (7) We should fight energetically against infection from sputum of tuberculosis; but we should not relax measures which, if relaxed, would permit of infection by milk and meat of animals.

(C) IN GREAT BRITAIN.

Lord Lister.

When Koch had finished his address in London he was immediately answered by the British representatives; later, he was answered in the medical press. Lord Lister, President of the

Congress, at once disagreed with him. Within a week his arguments against him were published in the *British Medical Journal* and the *Lancet*. In the one he deals with the error in Koch's views on primary intestinal tuberculosis; in the other with his erroneous conclusions generally. In the *British Medical Journal* he says: "The intestinal contents consist, of course, not only of food more or less altered, but also of the secretions of the various glands which pour their products into the alimentary tract. One such product is the bronchial mucus, which, together with the dust of the inhaled air, is brought up by the celia to the orifice of the larynx and perpetually swallowed unconsciously. The inhaled dust thus enters as truly into the composition of the intestinal contents as does the food; and in the case of a child fed on unboiled milk of a cow with a tuberculous udder in a room infested with tubercle it might be fairly open to question whether the bacillus of bovine tuberculosis imbibed at the meals or those of human tubercle from the air were the most numerous in the intestine. Hence the fact of the mesenteric glands being the only seat of tubercle in a milk-fed child is no proof that the bacilli which they contain were derived from the milk. This consideration may seem to favor Koch's hypothesis; but it, in truth, deprives his argument, based on the rarity of primary intestinal tuberculosis lesions in the child, in spite of the multitudes of bovine tubercle bacilli swallowed in milk, of any relevancy whatever."*

In the *Lancet*, the same week, he said: "What had chiefly riveted his attention had been the startling thesis that bovine tuberculosis could not develop in the human body. This was a matter of enormous practical importance; because if this conclusion were sound it would greatly simplify their preventive measures, but it would be a very serious and grievous thing if the rules now in force for the security in the purity of the milk supply be relaxed, and it should turn out after all that the conclusion was erroneous. For his own part he thought the evidence educed by Dr. Koch to show that human tuberculosis

* *Brit. Med. Jour.* II, 1901, 283. Aug. 3, 1901.

could not be communicated to bovine animals were not very conclusive. . . . . Even if it were established that human tuberculosis could not be communicated to cattle, it by no means necessarily followed that bovine tuberculosis could not be communicated to man. He took in illustration the case of variola. Attempts to inoculate human small-pox into the calf had been so very rarely successful that eminent pathologists had concluded that small-pox and cow-pox were entirely different diseases. We now know that this was an entire mistake, that cow-pox was small-pox modified by passing through the cow. He referred to some very interesting experiments by Dr. Monckton Copeman, who entirely failed to inoculate human small-pox into the calf, but invariably succeeded in inoculating it into the monkey ; and was as invariably successful when he introduced matter from pustules in the monkey into the calf, the result being ordinary cow-pox, which could be used in vaccinating children. It might be that some species of animal might serve as an intermediary host for tubercle between man and the bovine animal. Or it might turn out that, if sufficient experiments were made, human tuberculosis might prove occasionally transmissible to man, as was the virus of vaccine. The evidence, necessarily indirect, on which Koch relied as showing that bovine tuberculosis could not be transmitted to man did not seem at all conclusive. It consisted mainly in the alleged rarity of primary tuberculous internal lesions, in spite of the multitude of tubercle bacilli by children in milk. Even if it were admitted that primary tuberculous intestinal lesions were as rare in children as Koch's statements indicated, it was certainly true that tabes mesenterica existed in a considerable percentage of children who died from tuberculous disease without tubercle bacilli being found in any other part of the body. When the mesenteric glands were thus affected, without any discoverable intestinal lesion, the natural, and indeed inevitable interpretation seemed to him to be that the tubercle bacilli had passed through the intestinal mucus without causing obvious lesion in it and had been arrested in glands of the mesentery.

It was known that even typhoid bacilli, the essential place of development of which was in the intestinal mucous membrane, occasionally passed through it without producing the characteristic lesion. And if this occurred with typhoid bacilli how much more likely to occur with tubercle bacilli? If this were so, Koch's argument fell to the ground. As regards the experiments which Koch had referred to as inoculating bovine animals with material from the glands of children affected with tabes mesenterica, the result being negative, these experiments had been but few; and even were they more numerous, they could not, to his mind, be quite conclusive. It might be that tubercle from milk in the intestines might be so modified by passing through the human subject that the bacilli in the mesenteric glands, though derived from a bovine animal, might be no longer those of true bovine tubercle, but bacilli having the character of human tubercle, and disposed to develop in cattle."

McFadyean.

Professor John McFadyean had been celebrated as an anatomist, bacteriologist and college executive; but it was not till the occasion of the London Congress that he exhibited, at least to the full, the keenness of dialectic which there distinguished him. The day after Koch's address he rose to rebut his argument.

In the beginning he thus summarizes Koch's contention: (1) The bacilli found in cases of bovine tuberculosis are much more virulent for cattle and other domestic animals than the bacilli found in cases of human tuberculosis. (2) That the difference is so marked and so constant that it may be relied upon as a means of distinguishing the bacilli of bovine tuberculosis from those of the human disease, even assuming that the former may occasionally be found as a cause of disease in man. (3) If bovine bacilli are capable of causing disease in man there are abundant opportunities for the transfer of the bacilli from the one species to the other, and cases of primary intestinal tuberculosis from the consumption of tuberculous milk ought to be of common occurrence. But post-mortem examination of hu-

man beings proves that cases of primary intestinal tuberculosis are extremely rare, and therefore it must be concluded that the human subject is immune against infection with the bovine bacillus, or is so slightly susceptible that it is not necessary to take any steps to counteract the risk of infection in that way.

Professor McFadyean, with the utmost diffidence, ventured to submit that at least one of the premises contained in this argument is not well founded, that the others have little or no bearing on the question, and that there still remains reasonable grounds for regarding tuberculous cow's milk as distinctly dangerous to human beings.

It cannot be denied that what may be called bovine tubercle bacilli are, as a rule, distinctly more virulent for cattle and other domesticated animals than are human bacilli, or that the results of experiment indicate that in natural circumstances there is little danger of cattle being infected from human beings. But it cannot be admitted that the low virulence of human bacilli for cattle proves, or even makes probable that bovine bacilli have only a feeble pathogenic power for man. That might have been held to be probable if it had been shown that bovine bacilli were very virulent only for cattle; but since it is well established that these bacilli are highly dangerous for such diverse species as the rabbit, horse, dog, pig and sheep, in short for almost any quadruped on which they have been tried, it appears to be highly probable that they are dangerous for man. At any rate, it is impossible to cite any ascertained fact relating to other bacterial diseases that makes the contrary conclusion probable. It is well known that the majority of the disease-inciting bacteria are harmful to only one or two species; but all those that are common to all the domesticated animals are also pathogenic to man.

With regard to the second view, that the difference between human and bovine bacilli in respect of virulence for cattle, is of such a fixed and constant character that it may be relied upon to distinguish the one from the other, it need only be said that that is far from being proved. It appears to be quite possible

that what may be called the normal or average virulence of bovine bacilli for cattle may be reduced by passage through the human subject. Besides there are very great differences in the virulence of tubercle bacilli found in animals of the same species; and if a low degree of virulence for cattle is to be taken as the distinguishing feature of human bacilli, there need be no difficulty in proving that the human disease is sometimes transmitted to the lower animals.

With regard to Koch's third statement—and this is the one point in Professor Koch's argument which is germane to the point at issue, viz.: That only cases of primary intestinal tuberculosis can possibly have had their origin in the infected meat or milk, and that "such cases are rare." . . . . Professor Koch offers statistics for Germany. But the statistics are by no means unanimous and those that are likely to appeal with most force to the people in Great Britain are not at all in accord with those quoted from Germany. During the last few years the evidence obtainable from the post-mortem records of two of the largest hospitals for children in Great Britain have been analyzed with great care in order to see what evidence they afforded as to the relative frequency of the different methods of infection in tuberculosis. In the case of the Hospital for Sick Children in Great Ormond Street, London, this has been done by Dr. G. F. Still, and in the case of the Royal Hospital for Sick Children in Edinburgh, by Dr. T. Shennan. The conclusion at which Dr. Still arrived was that in 29.1 per cent. of the cases of tuberculosis in children, primary infection appeared to take place through the digestive tract. That is by far from being an insignificant proposition and is a striking fact that Dr. Shennan arrived at an almost identical conclusion and estimated that 28.1 per cent. of the cases of tuberculosis in children in Edinburgh are due to alimentary infection. . . . . One would only expect to be able to trace the disease to the milk when, after the onset of symptoms, pointing to infection by way of the mouth, the cows from which the milk was obtained were still available for examination. In practice this is rarely the

case, and it is therefore not surprising that medical literature contains very few specific instances of the infection of human beings with tuberculosis by means of milk. It is obvious, however, that the entire absence of evidence of this kind would in no way exonerate milk from the suspicion of being one of the causes of human tuberculosis. *

Delépine.

Professor Delépine of Owens College, Manchester, though himself not a veterinarian, has nevertheless been one of the most earnest investigators in bovine tuberculosis. His summary of arguments which might be educed against Koch may be at point here. 1. We have cases of veterinary surgeons becoming infected with tuberculosis as a result of wounds received during the necropsy of tuberculous cattle. Several such cases are fully recorded as authentic and their existence cannot be denied. 2. We have much post-mortem evidence to support the idea that bovine tuberculosis can produce tuberculosis in children by ingestion. 3. We have evidence that tuberculosis can be communicated to most of our domesticated animals. 4. In certain animals used as test animals *e. g.*—the guinea-pig—inoculations with products from human and bovine tuberculous subjects produce a disease which has all the chief characteristics of tuberculosis in either animals or man. This tuberculosis can be almost invariably obtained and follows a definite course, as I have been able to satisfy myself in some 3000 personal experiments. 5. Tuberculin, which contains specific chemical products generated by the tubercle bacillus can be obtained from tubercle bacilli of various origins, and tuberculous cattle react to tuberculin prepared from these various bacilli.†

Edgar M. Crookshank.

Edgar M. Crookshank in an introductory address before the Royal Veterinary College, Camden Town, in the autumn of 1901, on "Human and Bovine Tuberculosis," reminded his audience of an experiment which tended to disprove Koch's posi-

* *Lancet*, II, 1901, Aug. 3, 1901—P. 301.

† *Lancet* II, 1901, 304 305. Aug. 3, 1901.

tion. He inoculated a perfectly healthy calf intra-peritoneally, in 1888, with very virulent human tuberculous sputum, and the result was extensive tubercular deposit at the point of inoculation with hundreds of tuberculous new growths extending from it. The calf died of septicæmia 42 days after inoculation, and sufficient time had elapsed for pronounced tuberculosis of the peritoneum. On microscopic examination extremely minute tubercles were found disseminated throughout the liver and lungs. Long and beaded bacilli of the human type were found in these organs and in the peritoneal deposits. Sidney Martin, Crookshank said, had similar results.*

(*To be concluded.*)

* *Lancet* II, 1901, 1176. Nov. 2, 1901.

THE MASSACHUSETTS BOARD OF VETERINARY EXAMINERS.—At the meeting of the executive council, December 9, the new board of registration in veterinary medicine established by the last legislature was appointed, as follows: Langdon Frothingham, of Boston, for five years; Elmer W. Babson, of Gloucester, four years; George Penniman, of Worcester, three years; Henry S. Lewis, of Chelsea, two years; Thomas E. Maloney, of Fall River, one year. Dr. Lewis is, so far as we know, the first colored veterinarian to receive official appointment to a public position in this country.

ANCIENT AND MODERN TROTTING PARAPHERNALIA.—Yankee, the first horse to negotiate a mile in less than three minutes, drew a cart that weighed more than twice as much as the pneumatic contraption pulled by Lou Dillon when she circled the Memphis course in 1.58½, or exactly one minute and half a second faster than Yankee's mark at 2.59, made ninety-seven years ago. Commenting on the performance by Yankee a sporting paper at the time said: "The frail gig he drew weighed scarcely 100 pounds and no one but Yankee's driver cared to trust himself on it." Lou Dillon's sulky weighed twenty-four pounds one ounce. The present trotting queen wears four shoes that will weigh scarcely one pound. She requires no artificial weight nor appliances to balance her. All of her shoes together weigh not much more than one of the front shoes worn by Maud S. She is 15.1 hands high and weighed exactly 808 pounds when she created her world's record over the Memphis track.

MENINGITIS IN HORSES, CATTLE, SHEEP AND SWINE.*

By Louis B. Wilson, M. D., First Assistant Bacteriologist, and S. D. Brimhall, V. M. D., Director Veterinary Department.

Introductory.—Meningitis in horses, cattle, sheep and swine has occurred in Minnesota in small isolated outbreaks a number of times during the last few years. The first outbreak investigated in detail by this board was that reported in the Biennial Report for 1898, page 180, in which an organism not distinguishable from *diplococcus intracelluiaris meningitidis, Weichselbaum*, was isolated from the central nervous system of a cow, the fifth to die on a farm near Rosemount. In the Biennial Report for 1899-1900, page 459, two other outbreaks in cattle were reported; one at the State Experiment Station, and the other near Lake Minnetonka. Both of these were shown to be due to *diplococcus pneumoniæ*. In the same report, pages 285 and 460, is recorded the history of an outbreak of meningitis in horses near Herman. These were typical cases (seven in all) in history, symptoms and lesions. The last inoculation experiment from this outbreak reported in the previous Biennial Report (see page 462, horse No. 3) was incomplete at the time of the writing of the report. The first portion of this experiment is herewith repeated in connection with the final results of the experiment.

Horse No. 3. Very old. Tested with mallein, May 25, 1900; no reaction. Inoculated into left carotid artery May 29th with 3.5 c.c. of twenty-four and forty-eight-hour broth culture, emulsified with twenty-four and forty-eight-hour serum culture of diplococcus of *Herman meningitis stock*, second culture from brain of horse No. 2.

Animal showed no symptoms up to and including June 15th, and remained well (no rise of temperature).

June 15, 1900, at 2.30 P. M., animal inoculated subcutaneous-

* From the Nineteenth Report of the Minnesota State Board of Health.

ly just back of left shoulder with 500 c.c. forty-eight-hour plain broth culture of diplococcus from *Herman meningitis stock* "original." (Not passed through horse No. 2.) Also subcutaneously behind left shoulder with 500 c.c. forty-eight-hour plain broth culture of diplococcus from *Herman meningitis stock;* third culture from horse No. 2.

Friday, June 22nd, specimen of pus collected from abscess on left shoulder. Abscess had opened itself within the previous hour. Direct coverslip preparations showed abundant diplococci. No other microörganisms observed.

Cultures on Löffler's serum and on plain broth after twenty-four hours in incubator showed only diplococci present.

Nothing further occurred until Sunday morning, July 8, 1900, when horse noticed by attendant to be apparently "off his feed." Sunday evening was down, making frequent efforts to rise, being apparently weak in his back. Was able to rise on his fore feet, but could proceed no farther toward getting up. Horse tried to eat while down. Temperature taken Tuesday, July 10th at 3 P. M., subnormal. Animal found dead morning of Wednesday, July 11th, still warm.

Autopsy at 9 A. M. on the same day. Congestion of vessels, particularly the minute capillaries of the pia. No marked exudate in brain. Similar congestion in vessels of cord in cervical and lumbar regions. The left lung showed numerous small nodules, some of which contained a cheesy deposit surrounded by a tough capsule. One old scar and one nodule on the nasal septem. No ulcers.

Direct coverslip and serum and broth cultures were made from the meninges of (a) the superior surface of the cerebrum; (b) inferior surface of the temporal lobes; (c) cervical cord; (d) lumbar cord. Cultures also were taken from one nodule in lung.

Direct Coverslip Preparations.

(a) From superior surface of cerebrum showed no bacteria.

(b) From base of brain, a few diplococci.

(c) From cervical cord, many diplococci.

(d) From lumbar cord, few diplococci.

(e) From various nodules in lung, no bacteria.

Cultural Examinations.

(a) From superior surface of cerebrum, no growth either in broth or on serum.

(b) From base of brain, in broth fair growth; on serum, about twenty colonies of diplococci.

(c) From cervical cord, in broth, good growth; on serum, numerous isolated colonies, all diplococci.

(d) From lumbar cord, in broth, fair growth; on serum, about twenty colonies of diplococci.

(e) From nodule in lung, in broth, very abundant growth of small unevenly staining bacilli, probably *B. coli communis.*

The results of these two inoculations (see the above and horse No. 2, page 462, Biennial Report for 1899-1900) would seem to prove beyond a doubt the ætiological relationship of *diplococcus pneumoniæ* to the disease.

The following is a detailed statement of the examinations of cases of meningitis made from Jan. 1, 1901, to April 23, 1903:

Osakis, Douglas County (Horses)—Nov. 28, 1900, Dr. Brimhall visited the farm of Mr. F. P., near Osakis, Douglas County, to investigate the cause of death in horses. Mr. P. had lost four horses in a little over a week, and a fifth had been sick, but recovered. Those which died were sick from twenty-four to thirty-six hours. As they had all been dead several days, post-mortem examinations were out of the question, but from the description given by the owner, Dr. Brimhall felt certain that the cause of death was due to cerebro-spinal meningitis.

Another man living about ten miles north of Osakis had lost five horses with what he thought was the same trouble, but they had been dying one at a time for a period of three months. The diagnosis was very doubtful.

Torah, Stearns County (Cattle)—On Jan. 12, 1901, there was received from H. Bouman, M. D., Torah, Minn., the head of a cow, the fifth to die on a farm near Torah. All the cattle

except one were yearlings. They had been fed with corn stalks and unhusked corn. The symptoms noted were about the same in all animals. They refused to eat, showed great prostration and were unable to rise after the first day. The eyes were inflamed and swollen, with considerable discharge from both eyes and nose. There seemed to be marked fever, though temperatures were not taken. One died after two days' illness, three after three days' illness and one after two days' illness.

When the head was received in the laboratory it was in good condition and on opening the skull, well-marked meningitis was present. Diplococcus pneumoniæ was found abundantly in coverslip preparations and unmixed with other organisms in cultures.

Chanhassen Township, Carver County (Cattle)—Jan. 20, 1901, Dr. Brimhall visited the farm of Mr. A. H., Chanhassen Township, Carver County, to investigate the cause of death of Mr. H.'s cattle. Mr. H. had originally sixteen cows and two calves. Five of the cows had died after very short periods of illness, during which they showed rapidly ascending paralysis. One cow which had been sick and paralyzed so that she was unable to get on her feet had so far recovered at the time of Dr. Brimhall's visit that she was able to stand, though with difficulty. The owner gave a very clear description of the symptoms shown by cattle and Dr. Brimhall diagnosed the disease as cerebro-spinal meningitis. Isolation of the healthy cattle and disinfection of the stable was recommended. No further trouble from the disease arose.

Faribault, Rice County (Cattle)—June 21, 1901, Drs. Brimhall and Wilson, in company with Dr. L. Hay of Faribault, visited the farm of Mr. S., nine miles northwest of Faribault. About the first of April Mr. S. had lost a two-months'-old calf, which at that time was being fed on milk from the creamery. About a month later he lost a six-months'-old steer, and between that time and June 21 six other cattle, eight in all, had died. There were twenty-one animals originally in the herd. About half of them were cows and the remainder yearlings or six-

months'-old steers and heifers. Five of the young cattle and three cows had already died. The owner said that all the animals exhibited practically the same symptoms. They first became somewhat stupid, had a wild staring look in the eyes and seemed slightly stiff in the back. After a short time they all became crazy, and rushed about the barnyard and attempted to bunt the other cattle and the owner. The posterior portion of the body then became paralyzed. Throughout the disease all the animals made frequent straining attempts to pass fæces; all had diarrhœa, which in most cases was bloody. The animals died in from one to four days after showing symptoms of the disease. The local "cow doctor" examined some of the sick animals and pronounced the disease diphtheria. About June 15, Dr. Hay saw one of the sick animals, which was almost dead at the time. He killed it and made an autopsy. He did not skin the carcass nor examine the central nervous system, but otherwise the autopsy was complete. No lesions were found except a slight degree of entero-colitis. June 21 a small red cow had been sick for two days, but the owner thought she was a little improved over what she had been the previous day. She presented a staring condition of the eyes with stiffness and slight incoördination of the hind legs. Her temperature was 102.5°. The owner was instructed to ship the head and neck, in case the cow died, packed in ice to the laboratory.

June 25, at 9 A. M., there was received in the laboratory a head of the small red cow described above. An examination was made at once by Drs. Brimhall and Wilson. On removing the skin a few small hæmorrhages were found in the subcutaneous tissue on sides and back of the neck. None were found on the under side of the neck. These may have been due to bruises received from the rope or chain with which the animal had been tied. The pharynx was markedly inflamed. On opening the skull the vessels of the pia were found engorged with blood and considerable pus was present in the sulci, especially near the base of the cerebrum. (All of the tissues were very nicely preserved; large cakes of ice were still present in

the barrel containing the specimen when it was received in the laboratory.)

Direct coverslip preparations and broth and serum cultures were made from the hæmorrhagic subcutaneous areas and from various portions of the meninges. The upper two inches of the spinal cord divided into one-half inch segments with portions of the cortex of the left cerebrum were preserved in alcohol and formalin for histological examination. A portion of the medulla aseptically removed was used for inoculating rabbits Nos. 436 and 437. The direct coverslip preparations were stained with eosin and methylene blue. Careful search of all of them showed a few pairs of diplococci in those from the meninges. Cultures were examined after twenty-four hours in the incubator. Two broth and two serum cultures from the subcutaneous hæmorrhages developed no bacteria. Of the eight cultures from the various portions of the meninges, five—three broth and two serum—gave a growth of small, slowly growing diplococcus, which occasionally showed chains of four to eight individuals. No other bacteria were present in any of the cultures. Second cultures from the original ones from the meninges were sown heavily in the broth and on serum, and after twenty-four hours in the incubator were used for inoculation of rabbits Nos. 442 and 443, and of guinea-pigs Nos. 441 and 442.

Rabbits Nos. 436 and 437 inoculated subdurally with an emulsion of the medulla of the cow noted above, died after six and eighteen days respectively, having shown symptoms of meningitis, viz., excitement, holding of head to one side, stupor and death. The symptoms had begun thirty-six hours after the inoculation. At autopsy no lesions were present except in the meninges, where the vessels were intensely congested, and some of the sulci near the base of the cerebrum contained a small amount of pus. Direct coverslip preparations and cultures in broth and on serum showed *diplococcus pneumoniæ*, apparently unmixed with other organisms.

Rabbit No. 442 was inoculated in the left subdural space with 0.2 c.c. of the emulsion of a twenty-four-hour broth with a

twenty-four-hour Löffler's serum culture of the diplococcus, second from the original from the meninges of the cow, June 27, 1901. Only July 9, this animal began to show bilateral weakness of the muscles of the fore part of the body. There was no retraction of the head. The animal was found dead on July 11. At autopsy the meningeal vessels were found intensely congested, especially at the base of the brain. There was an increased amount of cerebro-spinal fluid. One small hepatized area was found in the right lung. The spleen was extremely small and of dark color. Direct coverslip preparations from the meninges showed diplococci. From the heart's blood no bacteria. Cultures in broth and on Löffler's serum showed many diplococci from the meninges. Those from the heart's blood gave no growth.

Rabbit No. 443 was inoculated intra-peritoneally, June 27, 1901, with 1.5 c.c. of an emulsion of a twenty-four-hour broth with a twenty-four-hour serum culture of the diplococcus, second from original from meninges of cow, also 0.5 c.c. of the same material was injected into the right nostril. July 10, the first symptoms of meningitis appeared similar to those noted in rabbit 442. The animal died July 12. Autopsy showed intense congestion in the vessels and meninges of the skull. Congestion was most marked at the base of the brain. There was considerable increase of fluid in the ventricles. The spleen was almost completely atrophied. Direct coverslip preparations from the meninges showed a few diplococci from the heart's blood; no bacteria. Cultures in the broth and on serum from the meninges showed a slight growth of diplococci. Those from the heart's blood no growth.

Guinea-pig No. 441 was inoculated June 27, 1901, in the left subdural space with 0.2 c.c. of the same material as that used in the inoculating of rabbits Nos. 444 and 443. The animal showed no symptoms at any time during the next succeeding six months, when it was used for another purpose.

Guinea-pig No. 442 was inoculated June 27, 1901, intraperitoneally with 0.5 c.c. of the emulsion of the same material

as that used for inoculating rabbits Nos. 442 and 443. The animal was also given 0.5 c.c. of the same material by high injection into the right nostril. This animal showed no symptoms during the ensuing six months, and it was then used for another purpose.

These several inoculations were undertaken to determine the possible presence of rabies virus. It would appear however that the early onset of the symptoms and death in rabbits 436 and 437; the production and symptoms of meningitis without posterior paralysis or retraction of the head by subdural and intra-peritoneal injection of pure cultures of the diplococcus in rabbits 442 and 443; and the failure to produce any symptoms in guinea-pigs Nos. 441 and 442 after similar inoculations with the same material; together with the uniform production of the lesions of meningitis and the multiplication of diplococcus pneumoniæ within the tissues of inoculated rabbits, would warrant the conclusion that the disease in the cow was meningitis due to *diplococcus pneumoniæ*, and unmixed with the virus of rabies or with other bacteria. This case would seem to be an important one owing to the difficulty sometimes experienced in distinguishing clinically between rabies and meningitis due to *diplococcus pneumoniæ*.

Lucas Township, Lyon County (Cattle)—Sept. 21, 1901, Drs. Annand and Wilson visited the farm of Mr. J. D. S., of Lucas Township, Lyon County, seven miles south of Cottonwood, Minn., to investigate an outbreak of an obscure disease. Mr. S. gave the following description of the cases: During the summer the cattle had been divided into two herds. A portion of them was kept on the farm on high rolling ground sown with rape. The other portion was in a large public grass pasture near Tracy. July 28, 1901, a cow on the home place was noticed to be sick, and died within twenty-four hours. Three weeks later, or about August 18, a calf became sick and when apparently about to die on same day was killed. Three weeks after this, or about December 8, another cow became sick and died within twenty-four hours. One week later, or September 16,

four young cattle, three of which had been brought back ten days previously from the pasture near Tracy, all became sick. Two of these at the time of the visit of Doctors Annand and Wilson were apparently better. The third was becoming slightly worse, and the fourth was almost dead. The symptoms as described by the owner were refusal of food, trembling, bellowing, "drooling" from the mouth and an entire inability to swallow either food or water. One of the animals had been apparently blind. No bloody discharges were observed from any organs of any of the animals. The two yearlings which were apparently on the road to recovery seemed somewhat emaciated and had some difficulty in swallowing, but were able to chew their cud. The third spent most of the time at the watering tank with his nose immersed in the water and made a "champing" motion with his jaws as though attempting to get the water into his mouth. It seemed entirely unable to swallow. It was very much emaciated, the eyes being notably sunken. The fourth animal was down and apparently unable to rise. It was breathing in a jerky manner as though in pain. It made no attempt to swallow, though it frequently champed its jaws. There was considerable drooling from the mouth. (The temperature of all the animals examined was normal.) The animal was killed by a blow on the head and an autopsy made at once. Careful examination of the tongue and throat regions revealed no lesions except a slight congestion in the posterior nares and throat. One-half the animal's body as well as the whole of the neck was skinned, but no hæmorrhagic areas were found. A small slightly hæmorrhagic spot was found on the wall of the third stomach. The spleen was shrunken. A careful examination was made of all of the internal organs, and no other lesions were noted except that both kidneys were on the right side of the abdomen, an apparently anatomical anomaly. The condition of the central nervous system was somewhat disguised by the method of killing—blow on head—but so far as could be determined no evidence of meningitis was present. Direct coverslip preparations and cultures were collected from

blood of the carotid artery, from lung, pericardial fluid, heart's blood, spleen, liver, and meninges.

One of the two serum cultures from the blood of the carotid artery developed one colony of streptococcus pyogenes aureus. The other culture and one of the two broth cultures remained sterile. The colony which developed may have come from the knife with which the artery was severed. The only other microörganism found in any of the cultures was a large oval spore-bearing bacillus which grew at room temperature on the surface of one of the two serum cultures made from the liver. Another serum culture from the same source showed no bacteria. These cultures were made on the open prairie with the wind blowing a gale so severe that the alcohol blast lamp was frequently extinguished. No bacteria of any kind were found in any of the direct coverslip preparations.

Oct. 5, 1901, Drs. Brimhall and Wilson again visited the farm of Mr. J. D. S., and examined several cattle sick of the disease described above. No animals were dead and it was impossible to secure any for the purpose of autopsy. Careful study was made of the clinical symptoms and despite the previous negative bacteriological findings it was thought that the disease was meningitis.

The history of the onset of the disease and the symptoms in these cases point to infectious meningitis. The normal temperature and the apparent absence of specific bacteria from the tissues of the sick animal, however, make the diagnosis of an infectious meningitis doubtful.

Crow Lake Township, Stearns County (*Cattle*)—Feb. 26, 1902, Dr. Brimhall investigated an outbreak of cattle disease in Crow Lake Township, Stearns County, near Belgrade. Cattle on several different farms had been dying of the disease, which presented some obscure symptoms, but resembling those described in the preceding outbreak. No cattle were very sick at the time of Dr. Brimhall's visit and none could be obtained for autopsy. From the owner's description of the symptoms and from the symptoms seen by him, Dr. Brimhall was of the opinion that

the cattle had been suffering from meningitis. Disinfection of stables, etc., was recommended and no more cases were reported.

Barden Township, Carver County (*Swine*)—Jan. 9, 1903, Mr. C. P. C. of Barden, Carver County, shipped to the laboratory three pigs of which he gave the following history: "The original litter contained nine pigs. They were born about Sept. 1, 1902, and had thriven well all the season until about the middle of December, when one was noticed having some trouble, which seemed like fits, coming on usually after they first came to the trough in the morning. They would get up to the trough and start to eat and then suddenly back up and sometimes would fall flat and breathe very hard with a grunting noise. This would last for an hour or more and then they would apparently be as well as ever. These spells became more frequent and longer in duration. The pigs died after about two weeks' sickness. Seven died, two were shipped to the laboratory along with a third healthy pig from another litter."

After arriving at the Laboratory of Animal Research the two sick ones showed spells similar to attacks of epilepsy, the smaller of the two having it much more severely. On this pig (No. 28 laboratory series), the following observations were made: The first attack came on the day after arrival and soon after having drunk water. The pig "backed up" and stood very stiffly. He made a peculiar grunting noise with each short, gasping respiration. This was quite typical of all the attacks, but after an attack which occurred on the 31st he breathed freely, but continued to show the short, grunting respiration. Animal was somewhat stiff all the time. Later the respiration seemed to improve, but the hind legs became weak and sufficiently paralyzed so as to prevent the animal from standing up. Temperatures were taken as follows: January 12, 103.8°; January 14, 103°; January 19, 104.3°. The pig was killed January 20 for the purpose of autopsy. No lesions were found except a small hæmorrhage in larynx at the side just above the cricoid cartilage. The pia at the base of the medulla was somewhat hæmorrhagic. Cultures from the lumbar cord and kidney showed no growth. Those

from the medulla, liver, heart's blood showed diplococci; from the spleen a large nonmotile bacillus (probably a contamination).

Rabbits Nos. 664 and 684 were inoculated intravenously and subdurally respectively, with cultures of the diplococcus from this case, but showed no symptoms during the ensuing two months, after which time they were used for other inoculations.

The other sick pig, No. 30, laboratory series, presented much the same symptoms as its companion. January 12 its temperature was 104.8°; January 19, 104.6°. Died January 24. Autopsy showed no gross lesions except marked injection of the mesenteric vessels, a few collapsed areas in one lung and some evidence of meningitis. Cultures from the heart's blood showed no growth; from the kidney, liver and spleen streptococci in short chains; and from the meninges diplococci and streptococci.

From the facts above given it would seem that both pigs were suffering from infection of *diplococcus pneumoniæ* with a secondary infection of streptococci in one of the animals. The low virulence of the organism may account for the somewhat chronic nature of the disease. The cases are, however, too few to warrant the drawing of any sweeping conclusions.

Hayward Township, Freeborn County (*Horses*)—Jan. 8, 1903, Dr. Annand visited the farm of Mr. G. P. T., three miles east of Glenville, Minn., Hayward Township, Freeborn County, to investigate a disease of horses.

Beginning about three weeks prior to the onset of the first symptoms Mr. T. had fed his horses on ensilage. On opening the silo some of the material from the top had been found considerably decomposed. This had been forked off and scattered about the barnyard. When the horses were first put on the fresh ensilage they refused it, but after a little time began to eat it quite freely.

According to the history obtained from the owner, "one mare was noticed not right at 4 P. M., Jan. 2, 1903. First symptoms noticed were slobbering; about three hours later uneasi-

ness in the stall; at 8 P. M. noticed that animal had lost power of deglutition. At the same hour noticed the animal trembling some. At 9 P. M. started to sweat, went down and unable to rise sometime between 10 and 11 P. M. When seen, paralyzed, tongue extended and the animal went from bad to worse until she died at 3 P. M., Jan. 3, 1903. This animal was seven years old and weighed 1,800 pounds. No post-mortem made."

The horse on which Dr. Annand held a post-mortem was noticed to be sick on Monday evening, January 5, and followed very much the same course as the other one except that it was not quite so aggravated, and died about 8 o'clock P. M., Jan. 7, 1903, after forty-eight hours' sickness.

Post-mortem made at 3 P. M., January 8. On cutting the animal open the first thing noticed was hydro-thorax and some fluid in the peritoneal cavity. The right lung was somewhat congested; the heart on one side seemed to be somewhat inflamed, but could not determine positively. It might have been hypostatic. The small intestines were somewhat injected and along the course of the mesenteric artery of small intestines there were bloody deposits. The liver was somewhat dark in color and quite easily torn. On opening up kidneys pustular matter was found in the pelvis. On removing the head a great amount of serum escaped and about the cord the meninges were more or less injected. On removing a portion of the spine in the sacro-lumbar region the vessels of the cord and its coverings were found much injected.

A portion of the lung, heart wall, spleen, liver, kidney and spinal cord and the whole of the brain enclosed in the skull were brought to the laboratory in a frozen condition. Specimens were examined the morning of Jan. 10, 1903. The lungs showed small collapsed areas; the heart wall showed a hæmorrhagic portion 1½ x 2 inches, very dark in color and evidently a lesion present before death. The cortex of the kidney was much congested. The meninges of the spinal cord and brain were congested but showed no pus.

Portions of tissue from each of the organs were preserved in

10 per cent. formaldehyde and in 96 per cent. alcohol. Cultures were made in broth and on serum from each of the organs, including both the meninges and white matter of the brain. After forty-eight hours in the incubator a growth was present in and on all of the cultures, excepting those from the brain substance which showed no growth on either medium.

After careful picking of colonies and sowing out on various media, the following organisms were isolated from the different sources:

Lungs.

(1) Streptococci in long chains; very numerous.

(2) Diplococci, apparently *diplococcus pneumoniæ.*

(3) *B. coli communis.*

Heart Wall. Streptococci only; long chains.

Spleen.

(1) Streptococci in long chains.

(2) Staphylococcus (albus?).

Liver. Streptococci.

Kidney. Streptococci.

Meninges of spinal cord. Streptococci, diplococci and large spore-bearing (putrefactive?) bacilli.

Meninges of brain.

(1) Streptococci and diplococci.

(2) Staphylococcus albus.

Brain substance. No growth.

At the time of Dr. Annand's visit another horse was sick. Temperature was 100.5°, respiration 22, pulse 58, mucous membrane of eyes was somewhat injected.

Jan. 28, 1903, Drs. Brimhall and Wilson visited the farm of Mr. G. P. T. again. On arrival a seven-year-old gray horse, No. 29, laboratory series, which had been sick for ten days was found down on its right side in the barn. The animal began ailing on January 11 and went down on January 18. The owner did not think until the horse went down that it was suffering from the same disease of which the others died. During this time Mr. T. had fed it gruel, milk, etc., from a bottle,

it being unable to swallow coarse food. The animal was apparently unable to make even an effort to rise, though it was able to freely move both front and hind legs. It could raise its nose but not its head. Sensation seemed to be entirely absent over the posterior extremities. Temperature of this animal was 105.2° at 8.30 A. M., January 22nd. This was the fourth animal out of five which Mr. T. had lost, the second being the one from which specimens were collected by Dr. Annand, Jan. 8, 1903.

The third was the horse noted by Dr. Annand as becoming sick on January 8, and concerning which data was to be supplied by Mr. T. The animal died January 12. Shortly after Dr. Annand's visit, two other horses were hired from a neighbor to do the work of the farm, but were kept in a shed apart from that in which Mr. T.'s horses had been sick. However, a door opened from this shed into the barn in which the sick horses had been kept.

Horse noted above was killed by bleeding, and an autopsy made at once. The throat, posterior pharynx and trachea were apparently normal. Lungs showed hypostatic congestion in the dependent portions, and a strip of consolidated tissue in the centre of the anterior lobe about three inches long and one-half inch wide on the left side. Several areas of hæmorrhage from one-fourth to one inch in diameter were found under the endocardium. The spleen was small and rather dried than normal. The liver was apparently fatty. The intestines and mesentery were apparently normal except for the presence of several aneurisms containing worms—*strongulus armatus*—in the mesenteric arteries. The kidneys were apparently normal—except for a clot—extracapsular—about the right (lower) kidney. On opening the spinal cord at the cervical region a large amount of reddish colored serum escaped. The meninges of the brain and cord were congested, but showed no pus. Congestion was most intense about the pons and base of the cerebrum. In the lumbar region of the cord small flakes of yellowish exudate (*fibrin*) were found attached to the pia of the cord.

Direct coverslip preparations, cultures and tissues for histo-

logical examination were collected from the trachea, lung, heart, spleen, liver, right hock and meninges of brain and spinal cord in the cervical and lumbar regions.

Direct coverslip preparations stained with eosin and methylene blue on examination showed bacteria, as follows:

Lung. Diplococci.
Heart's blood. Negative.
Spleen. Negative.
Liver. Negative.
Right hock. Negative.
Meninges of brain. Diplococci, (lanceolate, encapsulated, Gram-staining, some intracellular and some extracellular).
Cervical spinal cord. Ditto.
Lumbar spinal cord. Ditto.

Cultures in broth and on serum after incubation showed bacteria as follows:

Trachea. Numerous large and small bacilli; staphylococci. (No diplococci.)
Lung. Diplococci.
Heart's blood. Negative.
Spleen. A few streptococci.
Liver. Negative.
Right hock. Negative.
Meninges of brain. Diplococci (lanceolate Gram-staining).
Meninges of cervical spinal cord. Diplococci (lanceolate Gram-staining).
Meninges of lumbar spinal cord. Diplococci (lanceolate Gram-staining).

The diplococci isolated from the meninges of brain and spinal cord and from the lung gave a turbid growth in broth and after twenty-four hours a slight precipitate. On agar, white isolated colonies about 0.5 mm. in diameter.

In and on litmus lactose and litmus dextrose agar colonies developed similar to those on plain agar. The acid reaction on these media was variable within narrow limits, but there was no formation of gas bubbles.

On serum the colonies were somewhat larger in diameter than on agar, pasty in appearance and of the color of the serum.

No visible change was produced in milk after eight days' growth in the incubator.

In gelatin stab cultures only a very faint growth took place along the needle track after eight days.

Rabbit 671 was inoculated intravenously with 0.3 c.c. of a broth culture, fifth generation of the diplococcus from this horse. Animal died after four days.

At autopsy many diplococci were found in the exudate from the meninges both within and outside of the leucocytes. One small focus of pus was present in the right lung. No other gross lesions were discoverable.

Rabbit No. 685 was inoculated February 28, in left subdural space with 0.2 c.c. with emulsion of the serum culture from this case. The animal began to exhibit symptoms of meningitis on second day after inoculation and died seven days later. Marked meningitis was present at autopsy and *diplococcus pneumoniæ* was recovered from the meninges.

There can be no doubt that these cases were *meningitis*, due to *diplococcus pneumoniæ*. The same train of symptoms has however been reported by Pearson * as being reproduced by him in horses by feeding with ensilage. Therefore in order to determine whether the ensilage had anything to do with the direct production of the disease or with transmitting the organism to horses, the following experiments were conducted :

January 5 Mr. T. shipped to the laboratory in twenty-four sacks over one ton of the ensilage. Six of these sacks were filled with the half decomposed material described above, and the remaining eighteen sacks with good ensilage. The weather was cold at the time and the sacks were placed outdoors, where they remained frozen for some time. They then thawed out and began to decompose and mould.

(*To be concluded.*)

* Pearson. *Journal of Comparative Medicine and Veterinary Archives*, 1900, volume XXI., page 654.

A TEST OF THE IMMUNITY OF TREATED CATTLE AGAINST A NATURAL EXPOSURE TO TUBERCULOSIS.*

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A brief sketch of an experiment which was made in connection with some other tests as to the possible immunity of cattle against a natural exposure to tuberculosis may be of interest.

A cow, No. 211, which had been tested with tuberculin without reaction in 1902, received injections into the jugular vein of 10 c.c. of a moderately virulent human tubercle culture which had been cultivated in the laboratory for 59 to 62 generations. This culture did not appear to be longer virulent for cattle, although it was still virulent for guinea-pigs. The injections were made on July 19, August 6, August 20, September 25, and October 7, 1902, 10 c.c. of culture being used each time, 50 c.c. of culture, therefore, being used altogether. The second injection on August 6 produced an accelerated respiration. Otherwise, though the animal was thin, it appeared to be in a good healthy and fairly thrifty condition. During this time it had raised a healthy calf. On January 27, 1903, it was placed in a stall with tuberculous animals together with some others for the purpose of testing its immunity. Tested with tuberculin at this time no reaction was noted. On January 30, 1903, it was tested again with tuberculin without reaction. On August 6, 1903, it was killed and post-mortem made by Dr. Schroeder. He makes the following records of this examination:

The entire lung was sprinkled with minute white nodules about 1 mm. in diameter. The appearance was similar to that commonly seen in intravenous injections of human tubercle culture into cattle. The other organs and glands did not show tuberculous lesions, and while there were some circular red

* Published by the courtesy of Dr. D. E. Salmon, Chief of Bureau.

patches in the mediastinal glands, guinea-pigs inoculated from these did not become tuberculous. Guinea-pigs inoculated from the lung of this animal died of tuberculosis, showing that there were still live tubercle bacilli in the lung tissue. The presence of these live tubercle bacilli seemed to be due, therefore, to the inoculation with the human culture and not to an infection which the animal might possibly have gotten from the diseased animals in the stalls in which it was exposed. This animal, together with four check untreated animals, and two animals treated with dead bovine and human tubercle bacilli (in an experiment of Dr. Schroeder) were all exposed to infection in the stable from tuberculous cattle as previously noted, on January 27, 1903. The autopsies of these check and other animals showed tuberculosis of a character which could have been contracted from the exposure only, as the animals in the first instance were perfectly healthy. While the animal treated with the human germ was apparently resistant to the bovine disease, at the same time the human germ which had originally been injected was still persistent in the animal's system and was probably fairly widely distributed. While, therefore, fine animals which are to be used for breeding purposes might perhaps be immunized to advantage by the method, as suggested in 1894 by one of us (de Schweinitz), the practicability of such a method as applied to animals that are to be used as food or for the purpose of producing milk is questionable, as it is impossible to say how long the injected tubercle bacilli may remain alive.

The experiment is reported as a side issue in connection with a test that is being made for another purpose as one case in the line of these general immunization experiments which both ourselves and others in other parts of the country are conducting.

THE next meeting of the New Jersey State Board of Veterinary Medical Examiners, for the examination of candidates for license to practice in New Jersey, will be held at the State House, Trenton, N. J., the early part of January.

THE "CRAB" OR "FORGER."

COMPETITION FOR THE PRIZE OF TWENTY-FIVE DOLLARS OFFERED BY DR. WM. DOUGHERTY.

THIRD PAPER.

BY NO. THREE.*

"Forging" may be defined as an abnormal sound produced by striking the toe of the hind foot against the fore foot of the same side, and is the want of harmonious action between the anterior and posterior extremities, being either too great a rapidity of the movements of the hind limbs or an exaggerated slowness of those of the fore limbs.

Etiology.—(a) The general condition of the animal.
(b) Faulty conformation.
(c) Improper shoeing.

(a) Under the general causes may be mentioned fatigue, weakness, excessive use, improper training and some diseased state. Young horses put on the road as two and three-year-olds, mature horses which are over driven and those that are not accustomed to work at speed. The above conditions generally yield very readily to the influence of good sanitary conditions, judicious exercise, nutritious food and proper care.

(b) Under faulty conformation may be cited (1) The undesirable attitude of the horse standing under himself, which necessarily shortens the base of support, and the hind feet during locomotion have a tendency to meet the fore feet, whence results the forging. (2) The deficient length of the body relative to its height. (3) Excessive long posterior limbs compared to the length of the anterior. (4) An excessive long back and loins, which results in too great a flexibility of the spinal column, allowing the posterior extremities to reach the anterior more easily. (5) A voluminous and weighty head. (6) A short, thick and heavy muscled neck as well as the shoulders.

* The identity of the author remains the property of the REVIEW until the judges have rendered their decision. For conditions of the contest, see October REVIEW, page 628.

The two latter conditions surcharge the anterior limbs and determine a longer contact of the fore feet with the ground, which causes an appreciable tardiness in raising the fore feet. As a result of this delay, if the gait be lengthened the posterior feet not finding the place free which they should occupy strike against their corresponding homologues. Hence the particular sound which announces that the horse forges.

(c) Under improper shoeing I will name unlevel feet, ill-proportioned length of feet, heavy shoes (the animal being accustomed to light ones), extended toe of hind shoes, branches of fore shoes too long, heavy toe-calk on fore shoes (the animal being accustomed to rolling motion).

As to the question of soundness, I consider forging the natural consequence of the causes enumerated above, and that it does not constitute an unsoundness. If it is due to an anatomical or functional lesion, would not this be the unsoundness and the forging the resulting symptom?

* * *

FOURTH PAPER.

By No. Four.

Having to consider this subject from two standpoints only, viz., is the horse sound? and location of the anatomical lesion, it seems to me that the following would answer the foregoing subject, briefly and truly:

If I were to define forging, I would say it was a sound produced by the toe of the hind foot hitting the bottom of the shoe on the forward foot while the animal was in motion, caused by faulty conformation of the body in general.

The forging horse is sound by all means, for no pathological lesions as a rule exist. It is a fault of conformation, not confined to limb or foot, but to the body in general.

If we look at the conformation of such a horse ("forger") we will generally find a short-bodied, rather leggy animal, with a slow and rather uncontrollable movement, and the sound made by forging is produced by the toe of the hind feet coming

in contact with the bottom of the shoe on the forward feet, especially noticed when the animal is hurried.

I would consider a forger sound, unless he was a dummy, as is sometimes the case, or had other malformations which we consider an unsoundness. Forging does not interfere with the health or usefulness of such an animal, and he is in possession, generally, of as much perfection as is consistent with his conformation.

I consider that the anatomical lesion, if such it be, is a faulty conformation.

* * *

FIFTH PAPER.

BY NO. FIVE.

Forging is the result of any cause that prevents a horse from getting his fore feet out of the way of his hind ones in progression.

There are predisposing and exciting causes. Of the former, undue shortness of body is a frequent one.

Any cause, that interferes with the harmony of action between the fore and hind extremities, is more apt to cause "overreaching" in a short bodied horse than in one of desirable length.

Horses with the fore pasterns disproportionately long, when compared to the hind ones, especially if the fore feet are also inclined to unusual length, experience retardation in the flexion and extension of the fore legs to a degree that renders interference from the hind ones liable.

An important factor in good action is the straight advancing of the fore legs in progression. Any deviation from this, as in "winding-out" or "winding-in," or a combination of these two defects, sometimes called "wiggling," retards sufficiently prompt action of the fore legs to enable the feet to make way for the hind ones, at times.

These defects of action are the result of the bones that make up the foundation of the legs, being defectively related to one another in forming the joints. There are very palpable illus-

trations of these defects of formation in horses with knock-knees, calf-knees, " turned-in " or " turned-out " pasterns.

We notice in individuals a lack of harmony in formation between the fore and hind extremities. For instance, some horses have the pasterns of the hind extremities of a length altogether disproportionate to those of the fore, and *vice versa*. So with action, some have quick and extensive flexion of the hocks, out of proportion to the degree of promptness of the flexion and extension of the fore limbs. Such horses are very liable to forge.

Those of a phlegmatic temperament, particularly if they are low-headed, as they not only lack "snap" in their action, but the lowness of the head interferes with the freedom of the forward action.

The exciting causes may be summed up as those that overtax a horse's strength, as too heavy shoes in front, carrying too heavy a weight or drawing too heavy a load, particularly if pace is fast, and going heavy, also allowing the fore hoofs to grow too long. Lack of strength, as in undeveloped horses, in underfed or overworked ones, and also from fatigue. Horses with unresponsive mouths that bore on the bit.

Some horses, when uncollected, will forge that if stirred up with spur or whip will get their heads up and noses in and show no sign of it.

Forging is not an unsoundness. There is no lesion. It is a defect or fault, as bad carriage and defective action are.

* * *

[ERRATUM.—In the " Second Paper " of this contest, December REVIEW, page 841, line 7 of " Second Paper" for " Teuch " read " Peuch."—EDITOR.]

MORE than eighty horse shows were held in the United States in 1903, according to the " American Horse Show Blue Book " for the current year. The records disclose an increase of more than fifty per cent. in the number of exhibitions since 1902, only fifty-two having been listed in the Blue Book last year.

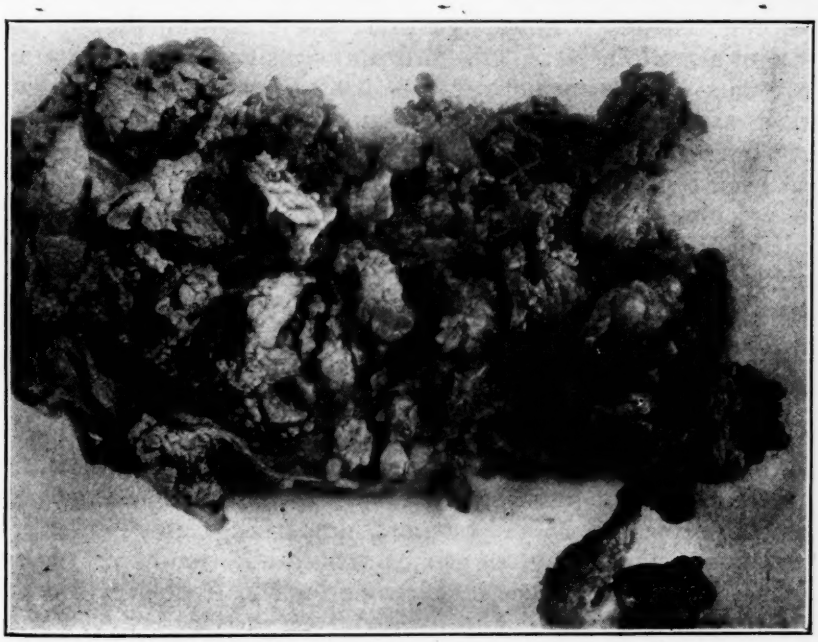
REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

CHRONIC HYPERTROPHIC SIMPLE PERITONITIS IN A COW.

By JOHN J. REPP, V. M. D., University of Pennsylvania, Philadelphia, Pa.

Some time since there was sent to me by Dr. G. A. Johnson, Inspector Bureau of Animal Industry, Sioux City, Iowa, a piece of the abdominal wall of a cow which had been slaughtered under his supervision in an abattoir. The piece which he sent was about a half square foot in size and included the muscular coats and the peritoneal lining. The muscles did not present anything abnormal, but the peritoneum was thickly studded by new growths varying in length from an eighth of an inch to an inch and a half. The largest ones were a half square inch on cross section at the thickest part. Some of them were attached by a narrow pedicle. The whole mass presented a cauliflower-like appearance. Upon close examination tuberculosis and parasitism were definitely excluded. As the new growths were dis-



tinctly fibrous in character the case was considered to be a simple peritonitis of hypertrophic character. There was no exudate and there was not the least sign of necrosis in the vegetation.

A photograph of a portion of the specimen, 5 in. x 8 in. in size, is here reproduced.

Such extensive vegetations never occur in man in this form of peritonitis and I believe they are rare in the domestic animals. It is the first case I have observed in which the vegetations were so marked, and Kitt in describing this disease in his "Pathologische Anatomie der Hausthiere," does not describe any such enormous outgrowths as are present in this case. Of course, in tubercular peritonitis the outgrowths may reach a much larger size.

TWO CASES OF AZOTURIA OCCURRING UNDER PECULIAR CIRCUMSTANCES.

By E. B. ACKERMAN, D. V. S., Brooklyn, N. Y.

I am afraid, in reporting the two following cases, that I will be credited with exaggerating the truth, and I could hardly blame my colleagues for doubting the facts. But as the pathology laid down by our text books hits so far from the mark, in cases of azoturia, we seem to be so far astray as to the true cause of it, that I feel justified in publishing these two cases.

The first case was a large draft horse, laid up for the purpose of a mallein test. On Thursday and Friday gave a strong reaction; maximum temperature 106° F., with large œdema at point of inoculation, which did not subside for several days. At the end of three weeks the horse was again laid up (he having been to work in the meantime), for the purpose of giving a dose of physic previous to a retest. He was prepared for physic ball on Wednesday, medicine administered on Thursday morning; on Friday he purged all day plentifully, the discharge being almost watery. On Friday night, about 10 o'clock, horse was taken with azoturia in stable, first in one leg, and inside of an hour in the other, when he went down. Urine very highly colored, viscid, and the characteristic odor of old urine. He had all the other symptoms of azoturia.

The other case was still more strange. This was also a large draft horse, about fourteen years old. Two years ago during the influenza epizoötic he had purpura hæmorrhagica. This fall he was again attacked by the same complaint; the owner remembering his former experience undertook to treat him himself, and treated and nursed him for about one week; when, not do-

ing any better, I was called in. Found him with all legs swollen, head and nose swollen, dyspnœa, petechiæ and blood in both nostrils; *not eating*, and this was what worried his owner most, as the swellings were not so bad as they were in first attack. Had horse under my treatment for two days, using my usually successful form of treatment for this complaint, combined with the new treatment ("Tallianine") for the increase of leucocytes (improved blood), when the horse suddenly showed uneasiness of one hind foot, broke into a profuse perspiration, began to knuckle and finally went down; was able to get up with help for 24 hours; urine characteristic color and consistency; then was unable to get up at all, and owner asked to have him destroyed.

The striking thing in this case was the appearance of two diseases diametrically opposed. Purpura hæmorrhagica is always a disease of debility; azoturia of plethora and overfeeding. In the first case, azoturia appeared after a good purge, while in stable without exercise.

WHOLESALE POISONING OF CATTLE—WHAT WAS THE CAUSE?

By Dr. Dickinson Gorsuch, Glencoe, Md.

On Sept. 6th, shortly after my return from the meeting at Ottawa, I was awakened early in the morning by a messenger from Mr. E. M. Gillet, proprietor of "Bacon Hall Stock Farm" and breeder of pure-bred Hereford cattle; the messenger said that eight of the cattle were sick and for me to get there as soon as I could. My first thought was, "What can be the trouble that so many cows are sick at one time?" Last summer Mr. Gillet bought between seven and eight tons of sugar cakes for food for his cattle; the cakes were made by a well-known firm, but the lard used in their manufacture was found to be rancid, and so they were sold at a very low figure. Mr. Gillet put the cakes on the barn floor and had fed them to the cattle right along; the cattle liked them and seemed to do well upon them. On the night of Sept. 4th the barn door was accidentally left open, the cattle got in and gorged themselves with the cakes. On Sept. 5th Mr. Gillet noticed that some of the cattle did not seem well, but did not take much notice of them. On the morning of the 6th I found the eight cattle scattered over a large field; all were down; some were sitting up; others were stretched out on their sides; they were groaning as if in a great deal of pain; they had all purged considerably and just before death would vomit a thin yellowish fluid. One cow died a few min-

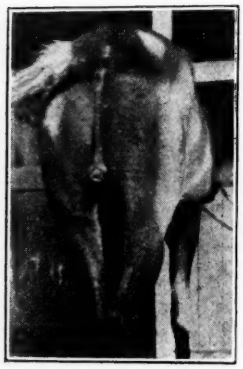
utes after my arrival, and another one died before I left. I prescribed stimulants and anodynes, gave what medicine I had with me and sent a man for more medicine. I went to see the cattle again about four o'clock P. M.; the man had been delayed in getting the medicine and hadn't returned. Two or three more had died; one had been taken sick since the morning. Mr. Gillet happened to remember that two more cows were missing, so we started to hunt for them; we found them in a little strip of woods along the upper edge of the field; one was sitting up with her head wedged in between some bushes; she was dead; the other one was near her and nearly dead; she died a short time after. One two-year-old heifer, which I thought nearly dead, recovered; she aborted the next day. I held a post-mortem on one cow, but did not find anything in particular. I found the rumen very full of food, which looked natural; the small intestines were empty. Eleven of the cows were sick—eight died.

My theory was that death was caused by ptomaine poisoning. I brought some of the cakes home, intending to have them analyzed, but neglected to do so, and still have them here. I should like to have the opinion of other veterinarians as to the cause of death of the animals, and also if there is a case on record similar to this one.

MAL-POSITION OF PENIS IN A CRYPTORCHID.

By Drs. White and Plaskett, Nashville, Tenn.

The accompanying photograph shows a rather unusual position of the penis. The horse is a well-developed four-year-old cryptorchid, in good health and anatomically perfect in every other particular.



The penis is fairly well developed, and when erected and protruded measures eight inches. The slightest manipulation causes its erection. Urine is passed without difficulty from a normal urethra.

A careful examination of the inguinal region fails to reveal the presence of either testicle; so we are warranted in concluding that they are in the abdominal cavity.

EXTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

PUNCTURE OF THE COLON PER RECTUM—ESERINE [*C. Cunningham*].—Under this heading the author relates a case of colic with severe continuous pains, pawing and scraping, wandering about his box, backing against the wall and into corners, sitting on his haunches, with a pulse of 80 and upwards, pupils dilated, eyes glaring, but with no outward tympanites worth mentioning, and which, during sixty hours resisted the usual laxatives and stimulants, sedatives and anodynes, clysters, fomentations, long-tube enemas, 2 grs. of sulph. of eserine in the jugular and 1 later under the skin, etc., when the thought came to him that he carried with him an 18-inch slender trocar and canula. He introduced it into the rectum, and through its coats punctured the dilated portion of the colon on the right portion, which had displaced the rectum. The gas was allowed to escape, and instantaneously the horse was relieved. The animal had a good passage shortly afterwards and moderate purgation the next day. In a day or two he was able to resume light work. The author suggests that this simple operation might be resorted to oftener; that it is as justifiable as that of the cæcum at the flank; that he had not had any bad results from it; that in cases where there is no externally apparent tympanites the condition and bulging of the colon can be readily felt through the rectum, and that by the operation many horses might be saved. In relation to eserine the author has been disappointed in somewhat similar cases; but in one other, however, where puncture per rectum was not indicated, 1½ grs. of eserine in the jugular gave him excellent results.—(*Vet. Record, Aug. 8, 1903.*)

FRACTURE OF THE PELVIS [*A. J. Williams*].—This case refers to a rather complicated fracture, which, treated for a long time, made sufficient recovery to allow some amount of work, but at post-mortem showed extensive lesions and partial incomplete union. The horse, while being put to harness, reared, fell backwards, and after getting up was lame. The right hip was much swollen, hot and painful; fracture was detected on rectal examination. The horse was put in slings and stayed in them for three months, when he was allowed walking exercise only

for two months longer, and then sent to light work. This he was able to do for about five months, showing only slight lameness, not more than one would expect as the result of shortening and the general deformity which was present. His duty consisted in carrying a man about 300 miles. Once or twice he showed an increase in the lameness, after a little harder day of work, but a few days of rest brought him back all right again. At last the lameness became so marked that he had to be laid up. On examination per rectum fracture of the shaft of the right ilium was detected immediately anterior to the acetabulum, an enormous callus, and a large spicula of bone projecting were also detected in the pelvic cavity. These conditions were confirmed at the post-mortem ; the shaft of the ilium was fractured ; there was one also through the wing of the same bone, midway between the external and internal angles ; the pubic symphysis was apart. There was also a large thick callus with long spiculæ, one of them projecting into the pelvic cavity.—(*Vet. Record, Sept. 12, 1903.*)

ECTOPIA CARDIS [*E. Morgan, M. R. C. V. S.*].—The animal was a full-time calf, which was able to suck, and was to all appearances fairly healthy, with the exception that his respiration was somewhat hurried, and when he was made to move quickly for a few yards had a rather distressing cough. The heart was situated at the postero-inferior portion of the neck, a little to the left side and quite anterior to the chest. Pulsation could be seen distinctly at ten yards distance and the shape of the heart could be felt by the hand. The beats, which were really a prolonged thrill and quite different from that of the pulse of a heart in normal position, were in average 120 per minute. When about three weeks old another enlargement could be seen posterior to the heart and to the right side. The calf was killed when seven weeks old. On cutting through the skin and subcutaneous tissues, the pericardium was exposed and in it the heart, well developed and healthy, as well as the blood vessels attached to it. To the right there was a swelling which contained about a pint and a half of pus. The cavity of the chest seemed to have its full capacity, but was almost empty, as the lungs were ill developed, each being only about half the size of one's hand. The opening between the first ribs was sufficiently large to allow the heart to pass to and fro. The calf came from a cow which in less than eight years had nine calves, of which six were bulls, and during that time had yielded 11,300 gallons of milk.—(*Vet. Record, Sept. 26, 1903.*)

DIAPHRAGMATIC HERNIA VIA FORAMEN SINISTRUM [*H. Begg, M. R. C. V. S.*].—About one hour after returning from her work, an aged mare, hardy worker and in good condition, was taken with the symptoms of flatulent colic, for which a dose of aloes and oil were prescribed, with a few doses to be administered to relieve the flatulency. The case seemed simple enough except that the mare had a most haggard expression, and when she was down she groaned and tried to roll on her back. As there was no change after a few hours and her temperature was rising, she received a full dose of salicylate of eserine; enemas were prescribed, and also mustard on the abdomen. She was reported as having been quiet during the night, but her pulse was found almost imperceptible and her temperature up to 104°. On auscultating the chest, a marked dullness was apparent in the lower half, particularly on the left side, and synchronous with the heart's action a sound of water being displaced was just audible. Later in the day the haggard expression was more marked; the fluid sounds accompanying the cardiac contractions were now well marked, and could be heard when standing at the head of the animal. The action of the heart was regular, quick, and weak, and the cavernous, tinkling watery sounds, occurred in perfect rhythm with the heart's action. These sounds were identical to those heard in traumatic pericarditis. The mare grew worse and finally died. At the post-mortem a loop of intestines, two yards long, was found lying between the lungs. It was highly congested and had made its way through the foramen sinistrum, which, though larger than usual, was intact. The author in putting the question, When did the hernia occur? thinks that it is quite possible that a small hernia had been present before the mare was taken ill, as long as the prolapse existed through a natural opening, and that it would not be improper to suppose that it had been increased through the struggles of an animal suffering from flatulent indigestion.—(*Vet. Record, Oct. 17, 1903.*)

ON THE PATHOLOGY OF INTUSSUSCEPTIONS [*E. M. Corner*].—In two very interesting articles, the author, after taking into consideration and criticising the ideas generally admitted on the pathology of these intestinal lesions in man and in animals, and having briefly presented the cases which have been recorded in veterinary literature, resumes the series of all the observations as follows: "According to the investigation of the cases found in veterinary works, there are 42 recorded, viz., 3 in ruminants, 13 in horses, 25 in dogs and cats, 1 in a monkey. Of

these cases, there were 4 which were evidently double intussusceptions, 10 or 12 which might have been considered as such. Nine invaginations occurred on the small intestines only; they were enteric. Twelve were ileo-colic; that is, invagination of the small intestine through the ileo-cæcal valve. Eight were colic and occurred on the large intestine only. There were none at the ileo-cæcal valve—a point of importance, as pathologists agree in attributing the origin of the intussusception to the valve. In dogs and cats, invaginations seem specially to occur on the small intestine. In horses also, when they are young, but when they are advanced in age it is in the cæcum. —(*Journ. of Comp. Pathol. and Therap., Sept., 1903.*)

CARCINOMAS OF RUMINANTS [*A. M. Tutter, M. R. C. V. S.*] —For many pathologists, carcinomas are rather rare in animals of the bovine species, but for the author it is an error, and he believes they are met oftener than it is generally admitted, and he gives a concise record of several cases where he has found this form of neoplasm: (1) A *squamous-cell carcinoma* of the orbit of a cow, in which the tissues of the ocular globe, muscles and the lachrymal gland had remained intact, while the eyelids near the nasal canthus of the left eye had been destroyed and replaced by a fungoid growth round and irregular, whose nature was confirmed by microscopical examination. (2) A *squamous-cell carcinoma* of the rumen of a cow, occupying the anterior pillar of the rumen. (3) *Another of the same nature* and in a similar situation under the aspect of a cancerous tumor, measuring 29 x 18 centim. It had the appearance of an enormous cauliflower. (4) *Another squamous-cell carcinoma* of the rumen, again in the same situation, and formed an irregularly circular tumor, fungoid and ulcerated, and measuring about 23 centim. in diameter. (5) *Squamous-cell carcinoma* of the lung of a cow, situated in the lower half of the left lung, where it had the shape of a lobulated tumor, in which the lobules had a consistency varying between pus and cartilage, with a coloration between a creamy white and a greenish yellow, and with dimensions varying between that of a seed of millet and a man's fist. (6) *Spheroidal-cell carcinoma* of a cow. At the post-mortem a large number of nodules were found on the peritoneum, the mesentery, the surface of both lungs, in the walls of the heart and in several of the abdominal muscles. These nodules varied in size and looked like artichoke. Their surface was irregular and papillated. Their consistency, although not always the same, was generally soft. The white-greyish color predomi-

nated in them, with intersections of reddish and yellowish streaks. In all the cases the diagnosis was confirmed by microscopic examination.—(*Journ. of Comp. Pathol. and Therap., Sept., 1903.*)

MAMMARY TUMOR IN A SOW [*A. G. Hopkins, D. V. M.*].—Towards weaning time, a thorough-bred Yorkshire, instead of having the mammæ reducing, they were enlarging towards the posterior part. A mild irritating application reduced the swelling, but did not remove it entirely; there remained a lump as big and as hard as a base-ball. At the time of the next parturition this became larger, much so, and remained until weaning epoch, but although it reduced some, it still was larger than in the first attack. Towards a third parturition the growth had reached such dimensions that it dragged on the ground, and its lower surface was all ulcerated by rubbing against it. As her litter had all died, it was decided to operate on her. The skin was dissected from its base and the tumor removed with the ecraseur. It was formed of hard tissue containing numerous pouches filled with pus of bad odor. It had but one main blood-vessel and weighed about 30 pounds. After a few weeks, as there were indications of a relapse, the sow was killed. The author has already met with one case similar. The animal was operated, but died from shock within a few hours after the operation.—(*Journ. of Comp. Pathol. and Ther., Sept., 1903.*)

BELGIAN REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

THE NEW COMPOUNDS OF SILVER USED IN MEDICINE [*Prof. Dupuis and Vanden Eeckhout*].—For a long time back nitrate of silver has been the only compound of this metal used in medicine. It was only after Miguel had found that it had eminently marked antiseptic properties that it became used in some diseases where infection played the principal part. But the objections due to its caustic action incited the researches of several scientists, and other compounds became known and tried. Among those first came *Collargol*, weak bactericide, which is indicated in all the infectious diseases of man and animals. In Germany it has been used in purpura, typhus, diarrhœa of calves, broncho-pneumonia, distemper, suppurations, furuncles, etc. *Protargol* is a compound of silver with a pro-

teic substance. It has a stronger bactericide action than nitrate of silver. As it is not caustic, it can be applied on mucous membranes. In veterinary medicine, it has given excellent results in the treatment of articular wounds, fistulæ of quittor, canker of the foot, all the diseases of the foot. Hermans has had good effects in infectious mammitis, in conjunctivitis, in microbian affections of the uterus and of the bladder. It is used in solution, 1:10. *Argonine* is a caseinate of silver. It is a very powerful bactericide, but not caustic nor irritating, even in concentrated solution. In veterinary medicine it can be used upon ulcerated surfaces, in abscesses and upon wounds of bad nature. A solution of 1 to 2 per cent. is generally used. *Ichtargan*, or thiohydrocarburo-sulphate of silver, possesses a most powerful bactericide action. Affections of the uterus in mares and diarrhœa of sucking colts and also arthritis of young animals have been treated by its use in solution of ½:1000—the solution of 1:1000 is slightly caustic for the uterine mucous membrane. *Argentamine* is a solution of phosphate or nitrate of silver in ethylenediamine. It is used in solution of 3–5 per cent., and can be employed in the treatment of wounds and solutions of continuity.—(*Ann. de Bruxelles, Sept., 1903.*)

CURIOUS CASE OF CRYPTORCHIDY IN A HORSE—OPERATION—RECOVERY [*Prof. T. Hendrickx*].—It is no doubt an interesting and curious case, and the history of this horse, which has been operated upon four times, the inguinal canal having been perforated four times and has had an eventration following one of those operations, is here given. The first time the operator was called to relieve a left cryptorchidy, but vainly felt for the testicle and gave it up after closing the scrotum with a suture. The next day there came the eventration, which was fortunately reduced, and with a suture high up on the scrotum was followed by recovery. Having been disposed of by the owner, the horse was after awhile reëxamined by another veterinarian, operated by him, but no testicle could be found. After recovery the horse again changed hands, when finally the author was called to examine him and to operate. This, however, proved a very difficult task, the inguinal canal having by the previous operations undergone alterations of a plastic nature. The difficulties, however, were overcome, and finally the cavity of the peritoneum was entered as near the external angle of the ilium as possible. But no testicle was found. Passing the hand on the bladder so as to find the efferent canal, the last being detected and traced, the spermatic cord was readily found, but tractions upon it failed to

bring the testicle outwards. Adding to the inguinal examination rectal exploration, the organ was finally detected, half way between the umbilical region and the anterior border of the penis, where it formed a rounded mass as big as two fists, and was adherent to the parietal wall of the peritoneum. To break up the adhesions was no little undertaking, and notwithstanding the manipulations of the left hand, whose index finger was lacerating them, those of the right hand in the rectum trying to dislodge it, and the tractions upon the cord made by a strong cord secured on it and pulled upon by an assistant, the author after an hour of hard work was physically and morally unable to proceed further. The wound was closed with suture well up on the scrotum. This third operation was again followed by easy and rapid recovery. In three weeks he was entirely well. Seven months later the animal was brought back to Prof. Hendrickx to be operated, either by the flank or by the inguinal tract. This last was decided as the best plan, and, notwithstanding the greatest difficulties, the testicle was finally let loose from its attachments to the peritoneum, brought into the inguinal canal and removed by the ordinary way with the ecraseur. There again the recovery was short and radical in three weeks. The testicle showed its external surface covered with irregular broken small bands, remains of the adhesions which had been torn and which evidently were due to an attack of localized peritonitis which had followed the first manipulations during the first attempt at castration. The testicle was three times the size of a normal organ.—(*Annal. de Med. Vet., Sept. and Oct., 1903.*)

Osteo-Sarcoma of the Cranial Arch in a Dog [*G. Hebrant*].—A strong four-year-old mastiff dog had for six months presented a peculiar abnormal aspect. His work, rather hard, lasting several hours a day, consisted in helping to pull a cart, and to start it it has been his habit, while pulling in the collar, to check his head up and down more or less, according to the difficulty in going ahead, and in so doing he knocked his head more or less severely against the floor of the cart. It was under the influence of the repeated contusions that the tumor which he had on his head was developed. This tumor was round, circumscribed by an irregular circular line which from the base of the nose reached the occiput in passing along the orbital arches and the base of the ears. This peculiar cranial cap had the size of a round loaf of bread. Its external face, entirely formed by the skin, which was not adherent to the tissues

underneath, presented about the middle of the forehead, an elevated part slightly conical. The consistency of the growth was that of fibrous tissue, homogeneous except in two places, where some fluctuation was detected. It was painless and firm, pressure upon it did not give rise to any cerebral manifestation. Notwithstanding this voluminous growth, his general condition was good, intellect preserved, the animal gay, hears well, sees well, but is obliged to carry his head well up to see. A diagnosis of osteo-sarcoma was made, and as no surgical treatment of any kind was likely to benefit him, he was left under observation. By degrees the tumor kept on spreading, the nose and eyes became involved, the general nutrition failed, and death took place in about two months and a half. At the post-mortem the diagnosis was fully confirmed by the appearance of the structure, and also by microscopic examination. The tumor cut vertically in its middle appeared formed of whitish tissue, fibrous, with here and there small crepitating nodules. In its greatest thickness, it measured near 20 centimetres. It was adherent to the nasal bones and invaded the frontal, parietal, temporal and occipital. It had spread inside of the cranium and reduced its dimensions, the brain showing on its surface depressions produced by the neoplasm. The lung presented in its structure nodules of various size and of aspect similar to that of the growth.—(*Annales de Méd. Vét., Sept., Oct., 1903.*)

CONGENITAL ABSENCE OF THE LARGE INTESTINE IN A DOG [*Mr. Heger*].—In making the autopsy of a slut which had served practical exercises in physiology, the following condition was observed: The digestive canal was astonishingly reduced; the stomach small, the great curvature not indicated, the large *cul de sac* indicated only by a tuberosity of about two centimetres; in following the small intestine, the appendix was soon reached; this was rudimentary, and at that point there was nothing indicating the presence of a cæcal dilatation nor of the two colons; the small intestine ends at the rectum. The slut during life seemed to be in perfect health, weighing 3 kil. 500 grams. The post-mortem showed the absence of all marks of old peritonitis and the integrity of the genital organs, liver, spleen and other visceræ. The following mensurations were taken: From the cardia to the pylorus, following the axis of the stomach, 11 centimetres; from the pylorus to the appendix, 66 centimetres; from the appendix to the anus, 10½ centimetres. The abdominal portion of the digestive canal was then only 11 centimetres longer than the body, which measured 76 centime-

tres from the tip of the nose to the anus.—(*Annales de Bruxelles, Sept., Oct., 1903.*)

GERMAN REVIEW.

By ADOLPH EICHHORN, D. V. S., Bureau of Animal Industry, Cudahy, Wis.

TWO CASES OF PRIMARY CARCINOMA ON THE EXTERNAL GENITAL ORGANS IN HORSES [*Dr. Hening, Berlin*].—To the few cases of primary carcinoma of the external genital organs in horses which are recorded in veterinary literature, the author adds two cases, which occurred in the polyclinic of the Veterinary High School in Berlin: (1) In a 15-year-old mare, a round, hard tumor of the size of a goose-egg, grayish-black in color, protruded from the inferior commissure of the vulva; its surface was ulcerated, gaped, and covered with cauliflower-like granulations. Each of these granulations, separated by furrows the size of which varied from a lentil-seed to a hazel-nut, set in the shape of stalks on the base of the tumor. The tumor laid on the swollen grayish-black clitoris, which easily bled, and was covered with nodules, from the size of a lentil-seed to a pea. The yellow serous offensive discharge, which formed on the surface of the tumor, was collected in a cavity about the size of a walnut, in the lower third of the tumor, before it escaped in drops from this cavity. The clinical diagnosis was "carcinoma of the clitoris," and the result of the microscopical examination of the successfully extirpated tumor left no doubt that the tumor was a primary pavement epithelial carcinoma, taking its origin from the epithelium of the mucous membrane of the glans clitoris. (2) In a mare, also 15 years old, in fair condition, a grayish-red tumor of the size of a walnut showed itself on the right lip of the vulva, about 1 c.m. from the ventral commissure. Its surface was gaped and covered with deep furrowed cauliflower-like granulations. On palpation at intervals of 2-3 c.m. above the large tumor, four smaller knotty thickenings of the size of a pea were noticeable, situated on the edge of the vulva. Other changes were not observed. In this case also, the tumors were removed by operation. The microscopical examination of the tumor corresponded with the diagnosis, proving a primary stratified epithelial carcinoma of the vulva, which originated from the epidermis of the outer skin.—(*Arch. f. Wiss. and prakt. Thierh.*)

THE AGGLUTINATION AS A DIAGNOSTIC AID FOR GLANDERS [*Pokschischensky*].—In earlier times the diagnosis of glanders in certain forms was frequently very difficult, and the value in this consideration by the mallein test is becoming less reliable, as is generally accepted. P. has been prompted by others to undertake a series of experiments to decide to what extent it is advisable to depend on the sero-diagnosis of glanders. For this purpose he has experimented with the blood serum of sixteen healthy, and eight glandered horses, two of the latter receiving mallein injections. Concerning the healthy horses, P. proved that the agglutination did not take place with the serum solution in the proportion of 1:300; on the contrary, the blood serum of the glandered horses caused a very distinct agglutination, as was found microscopically, even when the dilution was increased to 1:1000. Macroscopically, the agglutination was easily recognized when the dilution exceeded 1:500. On the other hand, the experiments concerning the agglutinizing power of the blood serum in the two glandered horses which were subjected to the influence of mallein, the blood serum when taken from the animals, when the reaction reached its height, showed that under the influence of the mallein injection the agglutinizing power of the blood serum was doubled; that even by a dilution of 2:1000, and sometimes even 3:1000, retained its agglutinization properties. This fact seems perfectly substantiated, that the agglutination is considered a defensive agent of the organism. It seems also from the foregoing experiments of P. that the introduction of mallein into the animal economy is apt to increase the quantity of agglutine, even in the absence of a thermic reaction.

ENZOÖTIC APPEARANCE OF SKIN GANGRENE IN HORSES CURED BY TINCTURE OF IODINE [*Prof. Fröhner, Berlin*].—In a large stable in Berlin, in the summer of 1899, numerous cases of skin gangrene were observed on entirely distinct parts of the body. These gangrenous spots were situated where the harness fitted closely. This enzoötic form of skin gangrene was probably caused by pressure of the harness, which by friction caused a superficial injury to the skin, and by the presence of the infectious agent in the stable. The character of the skin lesions proved very malignant, in which the necrosis advanced very rapidly, deeply, and extended to the sides. They resisted stubbornly the usual medication, and, contrary to this, tincture of iodine in combination with a sharp curette proved itself a sovereign remedy.—(*Monatsche. f. Thierheilk.*)

A CASE OF COLIC LASTING 30 DAYS [*Dr. Felder*].—A horse, 12 years of age, accidentally fell into a ditch. A short time afterwards severe colicky pains developed. On account of the absence of a veterinarian, a farrier was called in, who pursued a course of treatment for colic, as he thought due to constipation. Some days after Dr. F. was consulted, to whom the owner imparted the information that the animal for seven days past showed symptoms of colic, and had no movements of the bowels. The examination per rectum showed this empty. Internal peristalsis was feeble, but there was slight meteorism. After two days of energetic treatment, the patient passed fæces regularly, and it was thought the colic was cured. But after two more days the colicky pains reappeared, and defecation ceased completely. During the next eight days rectal injections were administered; the expelled water contained very little food mixed with it. At one time three small, smooth surfaced stones were passed. By exploration per rectum there was felt in the region of the left flank, at the bend of the floating colon, a distended body, as if filled with food. The solidity of the object was not determined. For four weeks the intermittent pain continued, until the horse became severely attacked with colic, and intensely turgid, that enterocentesis had to be performed, which indeed gave little relief. The animal died shortly afterward. On post-mortem, rupture of the stomach proved to be the cause of death. In the colon, anterior to the origin of the rectum, there was found a large oval intestinal calculus, completely occupying the lumen of the intestine. Its length in diameter was 25 cm., 14 cm. respectively and its weight 2¼ klg. Perhaps the accident to the animal by falling into the ditch, had caused the stone to be dislodged from its original position, and with the ingesta carried to the above mentioned place. As the owner relates, the horse had not suffered from colic for eight years previous.—(*Thier. Centralblatt.*)

CORROSIVE SUBLIMATE POISONING IN A HORSE [*Dr. Kronacher*].—An owner had a horse suffering with an infected wound of the foot, for which he was advised to use corrosive sublimate tablets in solution as an antiseptic and footbath. In spite of the warning and the caution to be used in their application, he allowed them to remain on the window-sill of the stable. A few days after, the horse got loose from its halter, and ate the box containing the tablets. The result was slight colicky pains, complete loss of appetite, on the first day; 20 grammes of iodide of potassium, 150 grammes of flower of sulphur in milk, was ad-

ministered ; also a large cupful of white of egg ; and in the meantime large quantities of milk were given. On the second day, diarrhœa appeared, with a thin pulpy to an almost fluid excrement, of grayish-green, to blackish-gray color. From the fourth to fifth day, the fæces gradually regained its normal color, and on the eighth day the animal became completely well.—(*Berl. Thierarzt. Woch.*)

REMOVAL OF A CANE FROM THE STOMACH OF AN OX [*Dr. Plosz, Budapest*].—In an acute case of meteorism in a sick ox, after repeatedly puncturing of the rumen, the animal did not regain his health, to the dissatisfaction of the owner. The latter called in a quack, who used a cane as a probang, and pushed it down as far as he could. The cane was swallowed by the animal. When the ox was received at the clinic, a painful swelling was noticeable on the left side, near the punctured wound ; the swelling was of the size of the palm of a hand, which, when pressed, a stinking gas escaped from the wound. For the purpose of removing the cane, after thoroughly cleaning the field of operation, on the left flank, a 10 c.m. long incision was made through the wound, after which two sacs, containing necrotic tissue and pus, were noticed. The opening of the abdominal cavity had to be postponed for six days, to prevent an infection of the peritoneum. After six days, the walls of the subcutaneous cavities were already filled with uniform granulations, and the laparotomy was performed. It was observed that the rumen adhered to the abdominal wall in a circular extension, and inside of the place of the adhesions a large cavity was present, containing about 3 litres of liquid and about 1½ kg. of tough fibrin. After the removal of this mass, an 8 c.m. long incision was made in the wall of the rumen, the hand introduced and the cane removed. The edges of the opening in the rumen were united by Lembert's method, and on the wound of the skin carbolic dressings were applied. Day after day the condition of the ox became worse, until death resulted on the fourth day after the operation. The autopsy showed, outside of the mentioned adhesions, a diffused, subacute, suppurative peritonitis, which must have been present before the performance of the operation, as due to the adhesions of the rumen with the abdominal wall, as infection could not have occurred during the laparotomy.—(*Veterinarius.*)

AT the recent election Veterinarian T. Earle Budd was chosen School Commissioner of Orange, N. J.

ARMY VETERINARY DEPARTMENT.

This REVIEW department was opened in the March number, and its object was there explained—the betterment of the Army Veterinary Service, through affording a forum for the discussion of subjects in which army veterinarians are deeply interested, and which are at the same time of interest and value to veterinary readers generally. The profession, and particularly army veterinarians, are invited to contribute communications, original articles, items of news, etc.

THE PETITION OF THE ARMY VETERINARIANS TO THE WAR DEPARTMENT.

The following petition, drawn up by Dr. Wm. V. Lusk, 2nd Cavalry, after getting the desires of the army veterinarians by a circular letter of inquiry, is being circulated in the States for signature:

"We, the undersigned veterinarians of the United States Army, have the honor to request that the General Staff of the Army recommend to the present Congress a bill to fix our status and pay, and thereby render unnecessary the numerous discussions and calls for decisions which are continually being brought to the attention of the War Department. We desire to be modest in our requests and would respectfully submit the folllowing, viz.:

"That the veterinarians of the United States Army, as now provided for by law, having five years service or over, shall have the rank, pay and allowances of First Lieutenants mounted, and that those with less than five years shall be commissioned as Second Lieutenants mounted.

"Provided, that not more than half the veterinarians provided for shall be commissioned as First Lieutenants; that promotion from the grade of Second Lieutenant to that of First Lieutenant shall be made by seniority, and that no veterinarian shall be eligible for promotion to the grade of First Lieutenant until he has served five years.

"Provided, further, that service as Veterinarian in the Quartermaster's Department as Assistant Instructor in Veterinary Science at the United States Military School, Fort Leaven-

worth, Kansas, shall be counted in computing length of service.

"We feel that such a measure would be reasonable and just. It would fix our status, give us something in the future to look forward to, and encourage us in our work. As it is, we have nothing in view for the future; we are not within the pension laws, although as much exposed to danger as any officer or enlisted man; our expenses are high and our pay small, with no prospects of increase except the extra five per cent. for every five years service up to twenty years. To lay aside anything for the future under such circumstances is impossible, and, as we are not eligible for retirement, the prospects of being discharged from the service for age or disability, and without means of supporting ourselves and families, is all but encouraging.

"Again, we are denied foreign service pay, a necessary extra compensation granted commissioned officers and enlisted men in order to enable them to defray the unusual expenses incurred upon them while serving outside of the United States. This is, undisputably, a great injustice, due, undoubtedly, to an oversight on the part of Congress.

"To conclude, we respectfully request that in case it is not deemed prudent to give us rank, that something be done to correct the error relative to foreign service, and that we be granted the privilege of retiring for disability or upon reaching the age of sixty-four years. Very respectfully,

"(Signatures.)"

NOTE:—Dr. G. E. Griffin, Artillery Corps, Fort Sheridan, Ills., being the last member on the list, has been requested to forward the properly signed petition to the veterinarian who takes the place of Dr. Lusk at Fort Myer, Va., the latter being under orders to the Philippine Islands. In the meantime Dr. Walter R. Grutzman, 15th Cavalry, has taken station at that post, and to him we have to trust to officially present the petition to the Adjutant General, U. S. A., in Washington, D. C. (O. S.)

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DR. NOCKOLDS' EUROPEAN OBSERVATIONS ANENT ARMY VETERINARY MATTERS.

1ST REGIMENT U. S. CAVALRY, FORT CLARK, TEXAS, Dec. 10, 1903.

Editors American Veterinary Review:

DEAR SIRS:—Having been away on a four months' leave in Europe and England, I have been unable to keep up with current events at home. From observations abroad I cannot

say that from a general standpoint the average veterinarian of the United States has anything to learn ; it is *vice versa.* There is too much of what was "good enough for my grandfather is good enough for me" over there.

In answer to the request to express views on the question of army veterinarians, my opinion is that the only correct way for them is a commssion if only as a second lieutenant. With that obtained, the position would be assured. I believe that the veterinarian would be better off as a second lieutenant at half pay than with double pay and no rank. Not that I would imply that rank makes a better man or more of a gentleman, as can be seen any day in the Army. Socially a man is what he makes himself, but officially rank counts in the service. I can in no way complain of the way I was treated by veterinarians in the services of different military organizations abroad, but must confess that it was a most difficult task to explain clearly our standing in the service to various officers in the foreign armies, and it always made me feel uneasy when asked by them about it ; especially was this true of the English army veterinarians, who have just accomplished, after many years of active agitation, what we are aiming for. There is no reason that we should not obtain quickly what they have taken so long to do with the extreme conservative methods of their War Department.

A commission, even of low rank, would be the thin edge of a wedge which could be slowly but surely driven home.

Very respectfully, COLEMAN NOCKOLDS.

"THE punctual visits of the REVIEW have been a source of great pleasure to me for several years. It is a worthy leader of our profession."—(*H. D. Fenimore, D. V. S., Los Angeles, Cal.*)

A KISS is a peculiar proposition. Of no use to one, yet absolute bliss to two. The small boy gets it for nothing, the young man has to steal it, and the old man has to buy it. The baby's right, the lover's privilege, the hypocrite's mask. To a young girl faith ; to a married woman hope and to an old maid charity.—*Burlington (Ia.) Journal.*

DR. G. E. MCEVERS, of Chicago, who formerly for nine years was first assistant to Dr. M. H. McKillip, and who has enjoyed a lucrative private practice for the past ten years, has retired to take the position of superintendent and veterinarian of Mr. B. Schrieber's stock farm, St. Louis, Mo.

THE AGE OF HORSES.

To tell the age of any horse,
Inspect the lower jaw, of course;
The six front teeth the tale will tell,
And every doubt and fear dispel.

Two middle "nippers" you behold
Before the colt is two weeks old,
Before eight weeks two more will come;
Eight months the "corners" cut the gum.

The outside grooves will disappear
From middle two in just one year.
In two years, from the second pair;
In three, the corners, too, are bare.

At two the middle "nippers" drop;
At three, the second pair can't stop.
When four years old the third pair goes;
At five a full new set he shows.

The deep black spots will pass from view
At six years from the middle two.
The second pair at seven years;
At eight the spot each "corner" clears.

From middle "nippers," upper jaw,
At nine the black spots will withdraw.
The second pair at ten are white;
Eleven finds the "corners" light.

As time goes on, the horsemen know,
The oval teeth three-sided grow;
They longer get, project before
Till twenty, when we know no more.

FAMOUS DRIVERS DEAD.—The trotting turf suffered severe loss in October when the last grip on the reins was loosened and death took off James Golden in Boston and Orin Hickok in Cleveland. Mr. Golden was but 56 years old, but since a boy of 19 he has been a trainer of horses. He was the youngest of a great school of trainers, Marvin, Hickok, Green, Turner and Splan, all of whom made their mark as trainers. Orin Hickok was really the seer of the turf. He was 80 years old, and passed away in an insane asylum in Cleveland.

SOCIETY MEETINGS.

ILLINOIS STATE VETERINARY MEDICAL ASSOCIATION.

Our twenty-first annual meeting was held in the Sherman House, Chicago, December 2d and 3d, 1903. The meeting was called to order by the President, Dr. H. A. Pressler, at 2 P. M., Dec. 2.

The minutes of the previous meeting were read and approved, after which the President delivered his annual address.

The following were present during the meeting:

Members.—Drs. H. A. Pressler, Fairbury; R. F. Hoadley, Yorkville; W. H. Curtiss, Marengo; J. H. Crawford, Harvard; F. H. Ames, Canton; H. B. Cale, Macomb; R. W. Story, Princeton; F. H. Barr, Pana; Jas. Smellie, Eureka; J. T. Nattress, Delavan; W. J. Martin, Kankakee; N. I. Stringer, Watseka; W. F. Scott, Oak Park; J. M. Kaylor, Barry; N. P. Whitmore, Gardner; C. C. Mills, Decatur; F. A. Gibbs, Palatine; John Scott, Peoria; C. H. Merrick, Okawville; L. C. Tiffany, Springfield; F. W. Kee, Sheldon; V. E. Frizzelle, La Moille; W. H. Welch, Lexington; N. W. Kyle, Colfax; W. F. Brownlee, Little York; H. J. Mongeau, Manteno; Matthew Wilson, Evanston; C. P. Draper, Arlington Heights; Jas. Robertson, Julius Mildenberg, A. H. Baker, Jos. Hughes, S. S. Baker, A. C. Worms, T. A. Kragness, R. G. Walker, E. L. Quitman, J. F. Ryan, Chicago; W. C. Hannawalt, Sheffield; T. J. Gunning, Neponset.

Visitors.—Drs. O. E. Dyson, A. M. Casper, M. Wooden, A. Hassall, L. H. McNay, W. H. Smith, J. B. Sine, A. N. Irwin, L. E. Day, Bureau of Animal Industry, Chicago; J. Y. Lehman, Sterling; Geo. H. Smith, Streator; J. W. Griffith, Cedar Rapids, Iowa; T. D. Hinebaugh, N. Dakota; D. E. Salmon, Chief Bureau of Animal Industry, Washington, D. C.; Leonard Pearson, State Veterinarian of Pennsylvania; W. H. Dalrymple, Veterinarian Louisiana State Experiment Station, Baton Rouge, La.; Geo. W. Pope, Superintendent U. S. Quarantine Station, Athenia, N. J.; — Myers, Indiana.

The following made application for membership, and, on motion, were duly elected: Drs. T. A. Kragness and Julius Mildenberg, Chicago; F. A. Gibbs, Palatine; H. J. Mongeau, Manteno; H. B. Cale, Macomb; W. F. Brownlee, Little York, and N. W. Kyle, Colfax.

The first paper read and very freely discussed was that of Dr. R. F. Hoadley, of Yorkville, on that ever interesting subject, "Paturient Paresis." The treatment advocated as being very superior to the "Schmidt treatment" was that of injecting *air* by means of the common bicycle pump into the udder until thoroughly inflated. The doctor claimed twenty-nine recoveries in thirty cases so treated. One or two others who had tried this endorsed it as superior to any treatment yet tried.

Dr. W. F. Scott, of Oak Park, followed with the subject of "Pyæmia and Septicæmia," and in a well-written paper advocated the administration of *calcium sulphide*, ending with a couple of case reports showing the advantage of the treatment.

"Colic" was the subject of a very able and interesting paper by Dr. A. C. Worms, of Chicago, in which he confined himself to those colics of indigestion, their causes, symptoms and treatment. A very interesting discussion followed.

A good practical paper was that of Dr. C. G. Glendenning, of Clinton, on "The Value of Eserine in Veterinary Practice." In this he showed the uses as well as discussed the many abuses of this valuable drug.

Dr. Geo. W. Pope, Athenia, New Jersey, of the Bureau of Animal Industry, was present greeting old friends, and made us a very pleasant address.

Drs. W. F. Scott and C. H. Merrick, of the State Board of Veterinary Examiners, made a verbal report of their work in their official capacity.

The Society now adjourned until 8 P. M., at which time the President called the meeting to order and proceeded to introduce Dr. D. E. Salmon, Chief of the Bureau of Animal Industry, Washington, D. C., who held the rapt attention of those present and made a very able and inspiring address. A great many of the Chicago members of the Bureau of Animal Industry were present and the address was certainly greatly appreciated.

Dr. A. H. Baker, of Chicago, one of the charter members of the Association, now took the floor, the occasion being the celebration of our twenty-first birthday. Dr. Baker gave a very interesting historical account of the Association from birth to the present. Of the present membership there remain but three who were present at its birth (Dr. J. F. Ryan, Dr. Jos. Hughes and Dr. A. H. Baker), all of Chicago.

Dr. W. H. Dalrymple, Veterinarian of the Louisiana State Experiment Station, and Dr. Leonard Pearson, State Veterinarian of Pennsylvania, were present and each made a nice talk.

The Society adjourned to meet the following morning at 9 o'clock at the Chicago Veterinary College for clinics.

Upon being reconvened at the Sherman House at 2 P. M., Dec. 3d, the first thing on the programme was a case report of Dr. W. H. Curtiss, Marengo; subject, "An Outbreak of Anthrax."

Dr. Jas. Robertson, of Chicago, read a very able and practical paper on the subject of "Corns."

The last subject on the programme was "Impaction of the Rumen," by Dr. C. D. Maulfair, McNabb.

Dr. Palmer, Secretary of the Michigan Veterinary Examining Board, was present and gave an interesting account of some experimental work on the treatment of skin diseases in cattle and sheep by dipping.

Dr. T. D. Hinebaugh, of N. Dakota, was present and made a very pleasant talk.

Report of the Treasurer showed balance on hand of $84.59.

The following bills were allowed: Dr. W. J. Martin, expenses Legislation Committee, $15; Dr. H. A. Pressler, expenses Legislation Committee, $15; printing circulars and invitations, $8; Secretary's fees, $10; stamps, $10; Sherman House, rent of room, $15. Total, $73.

Dr. A. H. Baker, W. J. Martin and N. I. Stringer audited the Treasurer's books and reported same O. K.

The President appointed Dr. W. J. Martin, T. J. Gunning and S. S. Baker a committee to draft suitable resolutions on the death of Dr. T. B. Newby. The following was unanimously adopted:

"WHEREAS, It has pleased the Great Creator of Heaven and Earth to remove from our midst, our late friend and professional brother, Dr. T. B. Newby, of Chicago; Be it

"*Resolved*, By the Illinois State Veterinary Medical Association in annual convention assembled that we sincerely condole with the family of our late lamented brother, in this their hour of trial and affliction, and devoutly commend them to the keeping of Him who looks with pitying eye upon the widowed and fatherless.

"*Resolved*, That in our natural sorrow for the loss of a faithful and honored friend, we find consolation in the belief that it is well with him for whom we mourn.

"*Resolved*, That while we deeply sympathize with those who were bound to our departed friend by the nearest and dearest ties, we share with them the hope of reunion in that better

world where there are no partings, and bliss ineffable forbids a tear.

"*Resolved*, That these resolutions be spread upon the records of this Association and a copy be transmitted to the family of the deceased.

W. J. Martin
" S. S. Baker } *Committee.*"
" T. J. Gunning

The following officers were elected for the ensuing year:

President—Dr. A. H. Baker, Chicago.

Vice-President—Dr. T. J. Nattress, Delavan.

Secretary—Dr. W. H. Welch, Lexington.

Treasurer—Dr. R. G. Walker, Chicago.

Board of Censors—Drs. H. B. Cale, Macomb; F. H. Barr, Pana, and E. L. Quitman, Chicago.

President-elect Baker was now called to the chair and appointed the following committees:

Programme.—Drs. W. J. Martin, Kankakee; C. A. Pierce, Elgin; and N. I. Stringer, Watseka.

Arrangements.—Drs. John Scott, Peoria, and F. H, Ames, Canton.

Legislation.—Drs. A. C. Worms, Chicago; E. J. List, Havana; and R. W. Story, Princeton.

A vote of thanks was given Dr. Salmon and all the retiring officers. Peoria was selected for the semi-annnal meeting on February 23d. Society adjourned to meet at Peoria February 23d.

W. H. WELCH, *Secretary.*

LICENSE TO PRACTICE IN NEW JERSEY.—Veterinarians desiring to practice veterinary medicine, surgery and dentistry in the State of New Jersey should make application for license to the State Board of Veterinary Medical Examiners without delay. The Board will conduct examinations for license in the Capitol at Trenton, January 22d and 23d. Those who fail to take the January examinations will not have another opportunity to obtain license until some time in June, as the Board only holds examinations twice each year. Dr. Whitfield Gray, Newton, is Secretary, and Dr. William Herbert Lowe, Paterson, is President. The office of the Board has been established at Paterson, N. J., the President's office. There is said to be a number of good locations in country towns open for well-qualified veterinarians in New Jersey, where there is either no practitioner at all or one who is not up to date in his knowledge and methods of modern practice.

NEW JERSEY SANITARY ASSOCIATION.

At the meeting of this Association, which occurred at Lakewood, Dec. 5, Dr. William Herbert Lowe, of Paterson, Chairman of the Committee on Animal Diseases and Animal Foods, presented the following report:

" *Mr. President and Gentlemen:*

" The chairman of your committee had the honor two years ago of reading a paper before the Association entitled ' Progress in Veterinary Medicine in its Relation to Public Health.' After the presentation and discussion of the paper the Association, in view of the great importance and necessity of the subject, decided to establish a committee on Animal Diseases and Animal Foods, which committee now begs to make its report, although of necessity it must be somewhat preliminary, as the magnitude and various aspects of the work of this committee are simply inexhaustible. Anything commensurate with the importance of the subject is quite out of the question at the present time.

" At the outset we must first recognize the fact that animal diseases and animal foods are largely agricultural or veterinary problems; and in the second place the control of communicable diseases and the production of sound and wholesome food products is essential to the health, comfort and life of civilized man, for any community without a wholesome meat and milk supply is in an unfortunate predicament. The qualified veterinarian is the natural expert on animals and animal food products, because he makes a special study of animal life and comparative medicine, understands animal pathology, and he is the one who has to be relied upon to diagnose and deal with communicable animal diseases.

" It is a deplorable fact that the general reputation of the veterinary profession in this State in the past has not been good. This has been caused in a great measure by the ignorance and deportment of untaught and unworthy veterinarians themselves. The enlightened public are not slow to recognize ability, education and skill, but they will not tolerate untaught and unworthy men, especially when they pretend to understand a science and undertake to practice an art that they know little if anything about.

" The Legislature of New Jersey placed a law upon the statute books (Chapter 18, laws 1902) regulating the practice of veterinary medicine in this State that will protect the public

from imposition and encourage qualified and worthy veterinarians.

"Among the subjects that this law requires veterinarians to be examined in are chemistry, bacteriology, hygiene, sanitary medicine and meat and milk inspection. Veterinarians in order to be eligible to take this examination must be graduates of a recognized veterinary college or university, giving at least a three-year course in veterinary medicine.

"The allied profession of human medicine is making commendable and notable advances in the matter of the appointment of qualified medical men as health officers, inspectors, etc., and there is no good reason why qualified veterinarians should not be selected to make veterinary examinations. The examination of milk, meat and other animal products has too long been left in the hands of laymen and others who have had no special education or training in veterinary and sanitary science. Meat and milk inspectors should be qualified veterinarians, and not butchers and laymen, who know little if anything about the science whose province is to study animal diseases and animal foods. Milk inspection should begin with the animal that produces it, and not with the product, as is commonly practiced. The interests of the producer have to be considered as well as the interests of the consumer.

"The division of authority in this State in regard to the investigation and control of animal diseases, the official recognition and encouragement of animal husbandry and the dairy interests, as well as of veterinary sanitary matters in general, is, in the opinion of your committee, exceedingly confusing and sometimes causes a good deal of delay, resulting in injury to live-stock owners as well as endangering public health through loss of time in reaching the proper authority to deal with some particular aspect of the subject.

"The Veterinary Medical Association of New Jersey, at its last annual meeting, held at Trenton, last January, considering the dangers of transmission of animal diseases to man through the meat and milk supply and the best interests of animal husbandry and industry, recommended that there be established at Trenton a State Bureau of Animal Industry whose executive officer should be a qualified veterinarian; that this bureau be connected with either the State Board of Agriculture or the State Board of Health, as might seem best; that this bureau be charged with all the veterinary sanitary work of the State. A conference committee of the Veterinary Medical Association of

New Jersey has been appointed to confer with the heads of the several departments and others concerned, with a view of reaching an amicable and satisfactory understanding, whereby all branches of this service could be merged into one bureau under veterinary direction and supervision without interfering with the present organization of the respective State boards or departments.

"It is thought that if a State Bureau of Animal Industry could be organized with a veterinary chief, as at Washington, it would be a great step in advance, both in reference to scientific regulation and economical administration.

"The scope of the work would be enlarged, unnecessary work dispensed with, and duplication now existing in the several boards would be eliminated. If the field and function of the new bureau were defined clearly it would prevent any encroachment by it upon other bureaus, or by other bureaus upon it. The veterinary profession of New Jersey does not seek to create a new board or department of the State government, but it favors the establishment of a bureau, under veterinary direction, charged with the animal industry and the veterinary sanitary work of the State. In this movement New Jersey has the precedent of at least one adjoining State, Pennsylvania, and a number of sister States throughout the country. Whenever such a bureau or board has been organized, it has brought about a marked improvement over the system which preceded its establishment. In Pennsylvania the regular appropriation to the State Live Stock Sanitary Board is $45,000 per annum. Last year the legislature of that State appropriated $25,000 additional with which it is proposed to establish an experimental station and conduct a farm for researches in vaccination against tuberculosis and for other lines of research.

"According to the Bureau of Animal Industry report from the census of 1900 there are in the State of New Jersey 165,000 milch cows; 74,000 other cattle; 74,000 horses; 48,000 mules; 175,000 swine and 41,000 sheep. The value of these animals in round numbers is sixteen million dollars. It is an investment of such importance from a financial point of view alone, that it is deserving of consideration and attention of the State authorities. Then there is the money value of the milk and other animal products, sent largely to the cities of New York and Philadelphia, to be considered. The public health side of the question cannot be estimated in dollars and cents, but in the health and lives of the human population.

"The example of the United States government in estab-

lishing the Bureau of Animal Industry with a qualified veterinarian as Chief of the Bureau, and the wonderful results achieved under his intelligent and sagacious direction, demonstrates the advantages of such a bureau to the producer, consumer and the general public.

"The work of this great bureau of our national government in original investigation of animal diseases, animal foods, in the veterinary inspection and extermination of contagious bovine pleuro-pneumonia, contagious foot-and-mouth disease and other animal plagues, in the betterment of the general conditions of the dairy industry of the country, in meat inspection for interstate and export trade and in the inspection and quarantine of imported animals, are branches of its service well known to sanitary scientists at home and abroad. The lesson your committee would draw from reference to the activities and functions of the Bureau of Animal Industry is that we may profit in New Jersey by learning what the federal government is doing for animal husbandry and modern veterinary science.

"There is no question but that New Jersey is more exposed to danger from communicable animal diseases than most other States. The quarantine station of the United States Government, at which nine-tenths of the animals imported into the United States, which are liable to bring in contagious diseases, are quarantined, is located at Athenia, near Paterson, in this State. This station being inland, there is danger of dissemination of disease along the railroad in case of animals being infected. There is the danger of attendants carrying the contagion out of the quarantine station.

"Then the State of New Jersey being at the Port of New York, where a large number of ships land at the docks on the Jersey side of the river, we are peculiarly exposed to contagion from articles of merchandise, like hides, wool, hair, etc. Enormous quantities of hides, wool, hair, and other animal products are continually being shipped to the contiguous States and carted from railroad stations to mills and factories, and such shipments are continually going through our State. Cases of anthrax are liable to occur in tanneries and in woolen mills among operatives who have to handle these products. Anthrax is a disease that has to be taken care of when it develops and the soil not allowed to become infected. An alluvial soil is peculiarly adapted to the propagation of anthrax, where the germs can multiply in the soil and the weather conditions are such as to bring these germs to the surface. In the summer time

there are liable to be outbreaks of the disease among the domestic animals, not only threatening the animals, but the general health of the people. A serious outbreak of anthrax occurred in South Jersey last summer, which was promptly brought under control by the State Board of Health.

"The recent outbreak of foot-and-mouth disease in the New England States is an illustration of the danger to which New Jersey is constantly exposed. There is just as much, if not more, reason to expect an outbreak of foot-and-mouth disease at any time in New Jersey as there was in Massachusetts.

"Another disease which is liable to be introduced in New Jersey at any time is a venereal disease of horses which exists in some of the Western States. It has been diagnosed *maladie du coit*, or disease of coition, as it is termed by the French.

"Rabies is a disease that is prevalent in certain parts of New Jersey, and one that measures should be taken to exterminate. It has been prevalent during the past year in my city—Paterson. A number of individuals have been bitten and one boy died not long since, notwithstanding the fact that he had received the Pasteur treatment.

"I will not detain you now to even mention the diseases that are communicable from animal to man, beyond saying that the State Board of Health is by strenuous efforts restricting and suppressing the dreadful ravages of glanders in the large cities in the northern part of our State. The Commission on Tuberculosis in animals is doing a good work in exterminating infection in dairies and in the inspection and testing of dairy cattle shipped into New Jersey. Both bodies, however, are handicapped for want of necessary funds to prosecute the work in a proper and efficient manner."

PASSAIC COUNTY VETERINARY MEDICAL ASSOCIATION.

The regular monthly meeting took place at 169 Paterson Street, Tuesday evening, Dec. 1, 1903, with President William Herbert Lowe in the chair, and the following members answered to roll-call: Drs. William J. Reagan, John H. Degraw, Wm. Herbert Lowe, Paterson; J. Payne Lowe, Passaic; Wm. J. Fredericks, Delawanna.

The minutes of last meeting were approved as read.

Dr. Wm. Herbert Lowe reported that Dr. George W. Pope, of the United States Quarantine at Athenia, N. J., was a delegate

to the Illinois State Veterinary Medical Association. We expect to receive a good report from him when he returns home. The State veterinary meeting will be held on Thursday, Jan. 14, 1904, at Trenton, N. J. Dr. Reagan's paper on "Poisoning in the Dog" and other papers and reports have appeared in the recent issues of the REVIEW.

Dr. William E. Brock was arrested at Rutherford in October for practicing veterinary medicine without a license.

There was a request made that all practitioners have photographs taken of all interesting cases and bring such before the meeting so that they may be thoroughly discussed.

The following report from Chief State Veterinarian Wm. Herbert Lowe was presented:

"*Glanders.*—Watering fountains and troughs have been closed in the large cities in the infected districts. Troughs in the city of Paterson have been closed since Aug. 13 as a preventive measure against the introduction of glanders into the city. Disinfection and whitewashing of blacksmith shops and hotel sheds and stables recommended. All drivers should carry their own water pails for watering their horses, and this will greatly help the veterinarian to stamp out the disease.

"*Rabies.*—Prevalent in Passaic County. The State Veterinarian has had a number of examinations and inoculations made at the State Laboratory of Hygiene at Trenton and the affected dogs have been destroyed. One of the several children who were bitten in Paterson and sent to Pasteur Institute in New York died, notwithstanding the treatment.

"*Tuberculosis.*—If practitioners will report cases of tuberculosis in dairy cows, the State Veterinarian will arrange to have the tuberculin test made and the diseased animals condemned and destroyed by the State.

"*Actinomycosis.*—The State Veterinarian reported that he had a recent case of this disease, and wished all veterinarians would report such cases promptly."

As there was no other business, meeting adjourned to Jan. 5, 1904. WILLIAM J. FREDERICKS, *Secretary.*

OHIO STATE VETERINARY MEDICAL ASSOCIATION.

On September 3 a semi-annual session of this Association was held in the parlors of the Park Hotel, Columbus, Ohio.

The specific purpose of the meeting was the consideration of a wide-spread feeling that our Constitution and By-Laws should be changed.

The meeting was called to order by the President, Dr. J. H. Blattenburg, at 10.15 A. M., with the following members present: J. H. Blattenburg, Lima; Louis P. Cook, Cincinnati; W. E. Clemons, Granville; L. W. Carl, Columbus; Harry Fulstow, Norwalk; Wm. H. Gribble, Washington C. H.; T. B. Hillock, Columbus; R. C. Hill, West Alexandria; N. Wells Hillock, Columbus; C. E. Inskeep, Urbana; J. E. Johnson and F. J. Kyle, Springfield; C. E. Leist, Columbus; S. D. Myers, Wilmington; F. F. Sheets, Van Wert; Walter Shaw, Dayton; David S. White, Columbus; J. A. Meagher, Glendale.

Such a large number of proposed changes were presented as to practically constitute a complete new set, and in view of this fact the following was prepared, attached to a copy of the existing laws, and offered for consideration: "We, the undersigned, request that at our next annual session our present Constitution and By-laws be presented to the Association for amendments, repeals, additions, or any other changes that that body may in its judgment see fit to make. (Signed) J. H. Blattenburg, W. H. Gribble, L. W. Carl, W. Shaw, T. B. Hillock, H. Fulstow."

An argument now sprung up as to whether the proposed changes must be accepted or rejected as they are, or whether they could be amended and then legally passed upon at the annual session. "Roberts' rules of order decide that they may be amended, but the amendment must be germane to the original amendment."

In order to save time, a committee of five was appointed to consider all the proposed changes and report at the annual meeting what in their judgment was for the best interests of the Association.

No further business appearing, the Association adjourned to attend the State Fair. WM. H. GRIBBLE, *Secretary.*

* * *

The twenty-first annual session of the Ohio State Veterinary Association will convene in the Veterinary Laboratory Building on the campus of the Ohio State University, Columbus, Ohio, Jan. 12 and 13, 1904. The sessions already held at the University speak for themselves, and need no comment here; "nuf sed."

Besides the election of officers, reading of papers and the clinics, etc., there will come up for consideration almost a complete change in the Constitution and By-Laws. Some changes are simply in the wording, others immaterial; but we do desire

to call your attention to two of them: one in reference to officers, and the other to qualifications for membership.

"*Officers.*—Reducing the number of vice-presidents from three to one; and adding three censors, who shall examine the credentials of all applicants.

"*Qualifications.*—All applicants shall be legal practitioners of Ohio and be graduates of veterinary schools having a curriculum of not less than three years of six months each, with at least four qualified veterinarians on the teaching staff, each lecturing not less than three times each week during the college year."

Every member should arrange to be present, and with voice and vote sanction or condemn these proposed changes.

WM. H. GRIBBLE, *Secretary.*

NORTH CAROLINA VETERINARY MEDICAL ASSOCIATION.

This Association met in Wilmington, July 28 and 29, 1903, in the Elks' Home. Many subjects of local interest were discussed and disposed of, *i. e.*, further legislation, Texas fever, municipal meat and milk inspection, etc.

The members of the Association feel much encouraged over the passage of our veterinary bill and the establishment of the Board of Examiners by the last legislature.

The election of officers resulted as follows:

President—Dr. J. W. Petty, Greensboro.

Vice President—Dr. C. J. Fleming, Winston.

Secretary—Dr. T. B. Carroll, Wilmington.

Treasurer—Dr. W. C. McMackin, Raleigh.

The Association adjourned to meet in Greensboro in July, 1904.

The State Board of Examiners met on the afternoons of the 28th and 29th. Dr. Tait Butler, of Raleigh, was chosen Chairman, and Dr. T. B. Carroll, of Wilmington, Secretary.

Four applicants for State Board certificates were examined and one certificate was granted—Dr. F. S. Charter, of High Point.

The Board will meet once a year at the time and place of the Association meeting. J. W. PETTY, *Secretary.*

VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY.

The annual meeting of this Association will be held at the Trenton House, Trenton, N. J., January 14, 1903, at 10 A. M.

The following are a few of the features which will be presented to those who are in attendance:

"Insects that are the Carriers and Cause of Animal Diseases," by Prof. John B. Smith, State Entomologist.

"Modes of Tubercular Infection in Wild Animals," by Dr. W. Reid Blair, Veterinarian and Resident Pathologist N. Y. Zoölogical Park.

"Forage Poisoning—So-called Cerebro-Spinal Meningitis," and "A Case of Supposed Tuberculosis in Horse with Results of Post-Mortem," by Dr. R. J. Halliday, Bayonne.

"Echoes from the New Jersey Sanitary Association Meeting," by Dr. L. E. Tuttle, Bernardsville.

"Report Concerning the Outbreak of a Peculiar Disease in Ocean County," by Dr. Chas. H. Perry, Lakewood.

"The Neglected Use of Anæsthetics in Veterinary Practice," by Dr. George W. Pope, Athenia.

Reports of various delegates and committeemen.

As a clinic Dr. R. E. Waters, of Gravesend, L. I., will operate on a cryptorchid provided a suitable subject can be secured.

GEO. W. POPE, *Secretary.*

ILLINOIS VETERINARY MEDICAL AND SURGICAL ASSOCIATION.

The fifteenth annual meeting will take place at the St. Nicholas Hotel, Decatur, Wednesday and Thursday, Jan. 13 and 14, when the following programme will be presented: "Fracture of Limbs," Dr. C. A. Hurlbutt, Stonington; "Horse Shoeing," Dr. R. W. Brathwaite, Champaign; "Hypodermic Stimulation," Dr. N. P. Whitmore, Gardner; "Open Joint," Dr. J. M. Reed, Mattoon; "Canine Distemper," Dr. A. Travis, Litchfield; "Contagious Opthalmia" (Bovine), Dr. F. D. Bliss, Earlville; "Parasitic Vulvites" (Bovine), Dr. John Turrell, Mackinaw; "Diagnosis of Lameness in the Horse," Dr. W. J. Martin, Kankakee; "Summer Sores," Dr. J. W. Marsh, Illiopolis; "Erysipelas," Dr. I. M. Luzador, Nokomis; "Spasms of the Glottis," Dr. F. Glassbrenner, Alton; "Quittor," Dr. D. K. Goodale, Mt. Vernon; report of cases.

KANSAS TO HAVE AN ASSOCIATION.

A call has been issued by Veterinarians N. S. Mayo (State Veterinarian), Manhattan; Richards, Emporia; Pritchard, Topeka, and Maxwell, Salina, for a meeting of all graduates in the

State of Kansas to be held at Topeka, Jan. 13 and 14, 1904, for the purpose of effecting a permanent organization.

Dr. Hugh S. Maxwell says in a note to the REVIEW, that every veterinarian known to the signers was addressed, though some may have been omitted through lack of knowledge of their existence. Therefore, he hopes that all who are eligible and who have escaped being notified, will lend their aid to the effort.

CALIFORNIA STATE VETERINARY MEDICAL ASSOCIATION.

This Association held its regular quarterly meeting Dec. 9, 1903, at the Palace Hotel, Room 1000, San Francisco, and it being the annual meeting, the following officers were elected for the ensuing year:

President—Charles H. Blemer.
Vice-President—R. A. Archibald.
Secretary—P. H. Browning.
Treasurer—Wm. F. Eagan.
Board of Examiners—H. A. Spencer, David F. Fox, Edward J. Creely.

The committee on Constitution and By-laws submitted its report, which was accepted.

The Judiciary Committee reported seven (7) convictions for violation of the new veterinary law of the State. Upon motion, the report of the Committee was accepted and the committee was complimented for its efficient work.

It was voted that the Association should publish a quarterly bulletin, under the name of the *Quarterly Bulletin of the California State Veterinary Medical Association*, said bulletin to be distributed at large to the veterinary profession of the State, its object being the elevation of the profession.

Dr. H. A. Spencer, of San Jose, read a very interesting paper on "Veterinary Fools, and their Influence on the Profession," which received considerable discussion.

Dr. A. S. Williams, of Marysville, read a paper on "Little Pills."

Dr. R. A. Archibald, of Oakland, read a paper entitled "No Title," which highly pleased the members of the Association.

The following members were selected to read papers at the next regular meeting, the subject to be selected by them: Drs. Creely, Welsh, Donnelly, McCullum, Sorrinson.

A judiciary committee, consisting of Drs. Archibald, President; Creely, Fox, Blemer and Browning, was appointed by the

chair to serve one year.

The Association is meeting with the hearty support of the profession throughout the State, and the meetings are largely attended. P. H. BROWNING, *Secretary.*

IOWA STATE VETERINARY MEDICAL ASSOCIATION.

The sixteenth annual meeting of this Association will be held in Des Moines, Jan. 27th and 28th. A varied and interesting programme is assured, and the clinic will be more than usually instructive. HAL. C. SIMPSON, *Secretary.*

NEWS AND ITEMS.

JUDGE WM. H. MOORE'S horses won $3880 in prizes at the recent Madison Square Garden Horse Show.

HORSE life insurance has, in the main, been disastrous to every capitalist who has tackled it, and after taking advantage of experience gained, both in Europe and America, horse life insurance is still an experiment.

WILLIAM M. WARREN, general manager of the large drug manufacturing house of Parke, Davis & Co., of Detroit, Mich., died Nov. 11, aged thirty-nine years. He entered their employ when seventeen years old, and rose to the highest position in the great establishment by personal worth, and to his wonderful executive ability is largely due the phenomenal success which has fallen to this house in recent years.

NO DOCKED HORSES IN THE ARMY.—Just before his retirement from the command of the Uuited States Army, Gen. Nelson A. Miles issued an order forbidding the docking of tails of army horses. "Any alterations in the length or shape of the tails, manes or forelocks of public horses by docking, banging or clipping is hereby prohibited and only such reasonable trimming and plucking as may be necessary to prevent shagginess of appearance will be permitted." The army regulations forbid the purchase of dock-tailed horses by purchasing agents.

THE handsome and well appointed new club house of St. Paul's Church Club, Paterson, N. J., was formally opened Nov. 9, 1903. Dr. William Herbert Lowe, President of the club, welcomed the members and guests in a few well chosen words, and addresses were made by Rev. Stuart Hamilton, Rector of St. Paul's Church, Hon. John W. Griggs, Attorney-General of the United States under the McKinley administration and former Governor of New Jersey, Judge Francis Scott and Judge

William I. Lewis; after which the house was thrown open to members and their guests. The club has a membership of 250 men and a waiting list. Bowling alleys, shuffleboards, pool, billiards and other games are provided in the new club house, which has become one of the most popular clubs among the young men of the city.

"NOW" is the name of a journal published in San Francisco, called by its editor "a journal of positive affirmations" and having as its motto "I am an unfolding soul." In a recent issue it has this to say about physicians: "A modern sickness treated in the modern style is one of the greatest travesties on common sense in the world of thought, unless it is some of the inanities of the religious creeds. One of the greatest burlesques of our day is to see a spectacled, be-whiskered, plug-hatted, long-tail-coated son of Esculapius engaged in a scientific combat over disease." Well, "Now!" Wouldn't it be interesting to see this "unfolding soul" wrestling with a plain attack of inflammatory rheumatism or some other painful affection?—(*Iowa Health Bulletin.*)

THINKS AN INJUSTICE IS BEING DONE TWO-YEAR-SCHOOLS.—The following letter from a Western subscriber explains itself. It is published *verbatim, et literatim, et punctuatim*, with the omissions only of his name and address, and the name of his deceased preceptor, whose memory we will permit to rest, in conformity with our correspondent's plea: "If you People intend to have me renew My Subscription for the American Veterinary Review, you will have to quit Runing down two year Veterinary College's and two year Graduates' as you well understand that the best Practitioners too day are two year men, and what is your object in runing down a first class Man like —— ——— ——— Who is far Superior to very many of you hot air Journalist's and no Gentlemen will tel wrong Story's about a good Man after he is dead and gone. "Let the dead rest,, I will admit that a three year School is not one minute to long to obtain a good Veterinary Education. This three year night School's Graduates that you are beging for all the time I met in the Philippine Islands. "The work they did on the Islands looked as if they did obtain their Education in the night time. Poor Sticks! One of the Teachers a Drunken felow of this wonderful Three year Night School was operateing before the class on aridgeling he run in his cruel hand I have got the ball as he expressed it and pulled out a dung Ball. yours truly. Business is good ——— ——— ——— "

VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table will be found the dates, places of meeting, and Secretaries' names and addresses of all the Veterinary Medical Associations of the United States and Canada, so far as obtainable by the REVIEW. Secretaries are urgently requested to see that the organizations which they represent respectively are included in the list, and that the details concerning them are properly stated. We shall be glad to receive notification of errors of commission and omission.

Name of Organization.	Date of Next Meeting.	Place of Meeting	Name and Address Secretary.
American V. M. Ass'n.....	Aug. 16-19, '04.	St. Louis, Mo.	J. J. Repp 5249 Addison St., Phila., Pa.
Vet. Med. Ass'n of N. J.....	Jan. 14, 1904.	Trenton.	G. W. Pope, Athenia, N. J.
Connecticut V. M. Ass'n.....	Feb. 2, 1904.	Hartford.	B. K. Dow, Willimantic.
New York S. V. M. Soc'y....	September, 1904	Brooklyn.	W. H. Kelly, Albany, N.Y.
Schuylkill Valley V. M. A....	.....	.....	W. G. Huyett, Wernersville, Pa.
Passaic Co. V. M. Ass'n.....	1st Tuesday of each month.	Paterson, N.J.	W. G. Fredericks, Delawanna, N. J.
Texas V. M. Ass'n.....	Call Ex. Com.	.....	H. D. Paxson, Ft. Worth.
Massachusetts Vet. Ass'n.....	Monthly.	Boston.	F. J. Babbitt, Lynn, Mass.
Maine Vet Med. Ass'n.....	.....	.....	C. L. Blakely.
Iowa-Nebraska S. V. M. Ass'n.	.....	.....	.....
Central Canada V. Ass'n.....	.....	Ottawa.	W. W. Boucher, Ottawa.
Michigan State V. M. Ass'n...	Feb. 2, 1904.	Lansing.	Judson Black, Richmond.
Alumni Ass'n N. Y.-A. V. C..	April, 1904.	141 W. 54th St	F. R. Hanson, N Y. City.
Illinois State V. M. Ass'n.....	Feb. 23.	Peoria.	W. H. Welch, Lexington, Ill
Wisconsin Soc. Vet. Grad.....	Call of Pres't.	Racine.	S. Beattie.
Illinois V. M. and Surg. A....	Jan. 13-14.	Decatur.	W. A. Swain, Mt. Pulaski, Ill
Vet. Ass'n of Manitoba.....	.....	.....	F. Torrance, Winnipeg.
North Carolina V. M. Ass'n...	July, 1904.	Greensboro.	T. B. Carroll, Wilmington.
Ontario Vet. Ass'n.....	.....	.....	C. H. Sweetapple, Toronto.
V. M. Ass'n New York Co....	1st Wednesday of each month.	141 W. 54th St	C. E. Clayton, N. Y. City.
Ohio State V. M. Ass'n.....	Jan. 12-13, '04.	Columbus.	W. H. Gribble, Washington C. H.
Western Penn. V. M. Ass'n...	1st Wednesday of each month.	Pittsburgh.	F. Weitzel, 100 Parkway, Allegheny.
Missouri Vet. Med. Ass'n.....	1904	Call of Officers	B. F. Kaupp, Kansas City.
Genesee Valley V. M. Ass'n...	.....	.....	W. E. Stocking, Medina, N.Y
Iowa State V. M. Ass'n.....	Jan. 27-28.	Des Moines.	H. C. Simpson, Denison, Ia.
Minnesota State V. M. Ass'n..	Jan. 21, 1904.	St. Paul.	J. S. Butler, Minneapolis.
Pennsylvania State V. M. A...	March, 1904.	Philadelphia.	C. J. Marshall, 2004 Pine St., Phila.
Keystone V. M. Ass'n.....	2d Tuesday of each month.	Philadelphia.	C. J. Marshall, 2004 Pine St., Phila
Colorado State V. M. Ass'n...	.....	.....	M. J. Woodliffe, Denver.
Missouri Valley V. Ass'n.....	.....	Kansas City.	B. F. Kaupp, Kansas City.
Rhode Island V. M. Ass'n....	January, 1904.	Providence.	T. E. Robinson, Westerly, R. I
North Dakota V. M. Ass'n....	2d Tues. Jan.	Grand Forks.	E. J. Davidson, Grand Forks.
California State V. M. Ass'n...	Mch. Je. Sep, Dc	San Francisco	P. H. Browning, San Jose.
Southern Auxiliary of California State V. M. Ass'n....	Jan. Apl. Jy, Oct.	Los Angeles.	H. D. Fenimore, Los Angeles.
Veterinary Graduates of Kansas.	Jan. 13-14, '04.	Topeka.	.....

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